Experts' Choice Awards
–See p.28

AMIGA WORLD

January 1992
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Fast, Faster, And Now. . .

FASTEST!

Eight 68040 Accelerators For Your Amiga



Productivity Software:

- Top 30 All-Time Best Picks
- Tips To Save You Money & Time

PLUS!

- Video "Layering" Tips
- DPaint Brush-Morphing
- *REVIEWS:* Video Blender, CanDo 1.5, X-OR Draw4D-Pro, SpectraColor, More. . .

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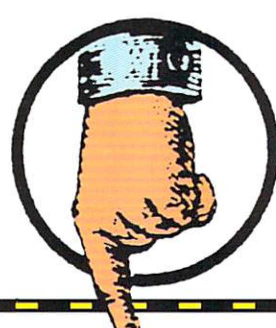
FREE VIDEO TOASTER DEMO TAPE!

We can't show you the power and quality of the Video Toaster in this magazine ad, so we've decided to prove it with a free VHS tape about the Toaster produced *entirely with the Toaster.* This unique demo-within-a-demo starring NewTek's Kiki Stockhammer is aptly-titled **"REVOLUTION"**. It will show you why the Video Toaster is the most successful and important product ever created for the Amiga.

Every $2495 Video Toaster comes complete with:
- Broadcast-Quality Four Input Switcher
- Real-Time Digital Video Effects
- 35 ns Character Generator
- 16.8 Million Color Paint System
- Interactive Color Processor
- Two 16.8 Million Color Frame Buffers
- 16.8 Million Color Frame Grabber
- Overlay Genlock
- Luminance Keyer
- 3D Modeling, Rendering and Animation

Whether you're doing graphics, animation, video production, or multimedia, the Toaster delivers stunning quality at a breakthrough price. Find out why everyone from *Time* and *USA Today* to *Business Week* and *Rolling Stone* are raving about the Toaster. Witness the **"REVOLUTION"** in your own home or office for free. Featuring the Toaster's mind-blowing effects, titles, and graphics along with animation by Todd Rundgren and 3D artist/LightWave programmer Allen Hastings, like the Toaster itself, this videotape will knock your socks off.

Also includes: Todd Rundgren's Toaster-Produced Music Video "Change Myself"



800•765•3406

NEWTEK
INCORPORATED

NOTE: Anyone who previously ordered "REVOLUTION" will be receiving their tape for free. Video Toaster and LightWave 3D are a trademarks of NewTek, Inc. © Newtek, Inc. 1991

Circle 37 on Reader Service card.

CONTENTS



*We're addressing all kinds of **productivity** issues in the January '92 AW. From powerful 68040 accelerators to speed up your machine (cover inset above), to our "Experts' Choice Awards" recommending the most useful productivity software, to our "Productivity Tips" series to enhance your own computer power—this month's AW is dedicated to helping you get the absolute maximum from your Amiga.*

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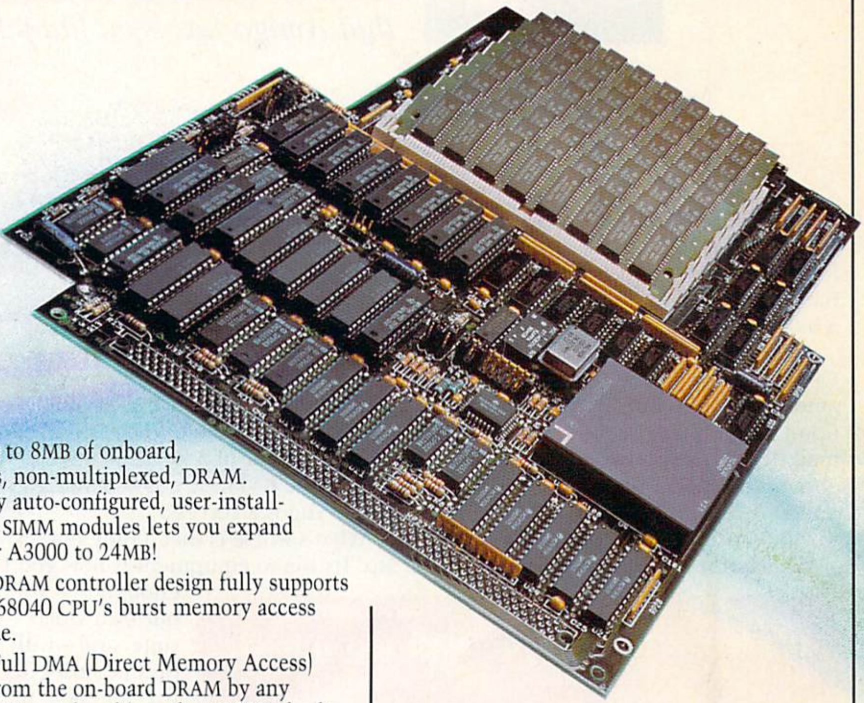
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THINK ALL '040 ACCELERATORS ARE THE SAME?

THINK AGAIN!



As a high power Amiga® 3000/3000T user you need a 68040 accelerator board for one reason ... and one reason only ... SPEED!

And once you know what makes one 68040 accelerator better than another, the only board you'll want is the **G-FORCE 040** from GVP.

WATCH OUT FOR SLOW DRAM BOTTLENECKS

Yes, all 68040 CPU's are created equal *but* this doesn't mean that all accelerator boards allow *your* A3000 to make the most of the 68040 CPU's incredible performance.

The A3000 was designed to work with low-cost, 80ns DRAM (memory) technology. As a result, anytime the '040 CPU accesses the A3000 motherboard, memory lots of CPU *wait-states* are introduced and all the reasons you bought your accelerator literally come to a screeching halt!

Not true for the **G-FORCE 040**...

SOLUTION: THE G-FORCE 040's FAST, 40ns, ON BOARD DRAM

To eliminate this memory access bottleneck, we designed a special 1MB, 32-bit wide, non-multiplexed, SIMM module using 40ns DRAMs (yes, *forty nanoseconds!*). This revolutionary memory module allows the **G–FORCE 040** to be populated with up to 8MB of state-of-the-art, high performance, on-board DRAM. Think of this as a giant 8MB cache which lets the '040 CPU race along at the top performance speeds you paid for.

SHOP SMART: COMPARE THESE G-FORCE 040 SPECS TO ANY OTHER '040 ACCELERATOR

▶ 68040 CPU running at 28Mhz providing 22 MIPS and 3.75 MFLOPS!
NOTE: The 68040 incorporates a CPU, MMU, FPU and separate 4KB data and instruction caches on a single chip.

▶ 0 to 8MB of onboard, 40ns, non-multiplexed, DRAM. Fully auto-configured, user-installable SIMM modules lets you expand your A3000 to 24MB!

▶ DRAM controller design fully supports the 68040 CPU's burst memory access mode.

▶ Full DMA (Direct Memory Access) to/from the on-board DRAM by any A3000 peripheral (e.g: the A3000's built-in hard disk controller).

▶ Asynchronous design allows the 68040 to run at clock speeds independent of the A3000 motherboard speed. Allows easy upgrade to 33Mhz 68040 (over 25.3 MIPS!) when available from Motorola.

▶ Hardware support for allowing V2.0 Kickstart ROM to be copied into and mirrored by the high performance on-board DRAM. Its like caching the entire operating system!

▶ Software switchable 68030 "fallback" mode for full backward compatibility with the A3000's native 68030 CPU.

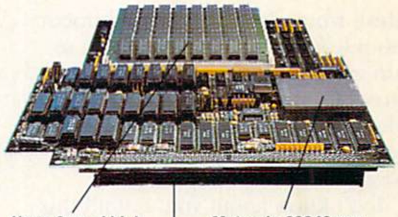
▶ Incorporates GVP's proven quality, experience and leadership in Amiga accelerator products.

TRY A RAM DISK PERFORMANCE TEST AND SEE FOR YOURSELF HOW THE G-FORCE 040 OUT PERFORMS THE COMPETITION

Ask your dealer to run any "RAM disk" performance test and see the **G-FORCE 040**'s amazing powers in action.

So now that you know the facts, order your **G-FORCE 040** today. After all, the *only* reason why you need an '040 accelerator is ***SPEED***!

G-FORCE 040™



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CHIEF CONCERNS

The big boys are trying to reinvent the multimedia wheel that Amiga has been happily rolling on for some time.

WHEN YOU HEAR the words junk mail, you probably think of some envelope with Ed McMahon's bloated mug harping about how you may have won a billion dollars.

I won't argue that the Publisher's Clearinghouse wastes an obscene amount of pulp, but I've happened upon an even more rank source of junk mail. It's all the press releases I get about multimedia products like CD-I and DVI that are going to change the world, but so far only represent vapor.

While most of us simply toss out the rubbish from ole Ed, these multimedia press releases come back to haunt us again and again. You see, it's just a matter of time before all the computer trade rags pick up the same tired multimedia torch and herald this stuff as God's gift to computing.

I don't know about you, but all this wasted paper has got me madder than a Supreme Court nominee.

It's easy to dismiss all this stuff you can't buy, but recent batches of press releases talk about products actually shipping, and this makes me nervous.

The newest and, for now, biggest wave is a thing called multimedia PC, or MPC. This is a standard drawn up by perennial industry instigator Microsoft and supported by such notable vendors as Tandy, NEC, and, to some degree, IBM.

It's the Tandy guys that have me worried. Let's face it. Any company that can sell cheesy Realistic stereo equipment to thousands of tone-deaf, mall-walking mutants can also sell multimedia. I should know, since I'm still the owner of a Realistic Stereo Modulette 8. These guys could have made Yugos a success.

What's worse is that Tandy has grown up. Its stereo equipment is now good enough that it fills our own video suite, and—with decent, cost-effective systems—it has also become a major force in the PC biz. It's tough to dump on Tandy these days, much as I'd like to.

It seems that anyone with any muscle at all is getting into multimedia, and sooner or later someone besides Commodore is going to get it right.

Tandy and countless others will sell PCs that are upgraded with 8-bit sound and a fast CD-ROM device. This is the computer equivalent of CDTV, but with a focus on keyboard and mouse control.

I want to say this technology stinks, but it doesn't. While it's a yawn for Amiga users, it is a major move forward for PC users, and many of the titles are quite inventive. This makes me nervous.

MPC vendors are really just attempting to recreate the Amiga market. Owners of these new systems will learn a heap of new terms: authoring system, framegrabber, genlock, frame rates, MIDI, NTSC, and so on, and they'll try to do many of the things we do already.

It's not just Tandy and Microsoft, either. Apple and IBM have ganged together to work on a multimedia PC that's due in a few years or less, and just recently IBM announced a system that has sound, CD-ROM, scads of memory, and a multitasking operating system. It seems that anyone with any muscle at all is getting into multimedia, and sooner or later someone besides Commodore is going to get it right.

When I used to cover PCs, small vendors would always say that IBM's entry into their segment would "legitimize the market and boost overall sales." This was mostly a euphemism for "IBM will squash me like a bug in about a week."

In the case of multimedia, I'm starting to think that the entry of strong vendors *will* boost the overall market. These heavyweights are teaching people about multimedia, which gives the Amiga a great shot at new customers. And since the Amiga has such a unique position, it will grow.

Think of it. We've already got DCTV, Imagine, and Disney; the Firecracker, DPaint, and AmigaVision; CanDo, Caligary, and The Director. We've got the Toaster and the Blender, Bars&-Pipes and CDTV. We've got multitasking, and blitters, and megs upon megs of fully addressable RAM. And we have video timing.

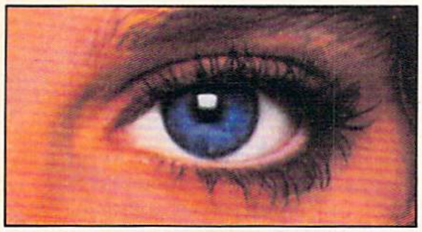
So if anyone tells you that Apple, IBM, Microsoft, and Tandy will kill off the Amiga, look 'em square in the eye and tell the pea-brain this. "If I put your brain inside a penguin, the penguin would walk backwards." ■



WHAT HAS 16M COLORS, 24-BIT FRAME BUFFER +GENLOCK+FRAMEGRABBER+FLICKER-ELIMINATOR +PIP+VIDEO TITLER+3D MODELLING SYSTEM?

Introducing the IMPACT VISION 24™ from GVP

The All-In-One Video Peripheral for the A3000 and A2000



If you're into video, IMPACT VISION-24 is truly a dream come true for your A3000 or A2000. It is the first multi-function peripheral specifically designed for the A3000's video expansion slot.
With the optional A2000 genlock slot adaptor kit, it also perfectly complements and enhances the A2000.
Check out these features, all packed on a single Amiga® expansion board!



▶ **Separate Composite and Component Video (RGB+Sync) Genlocks.** RGB genlock operates in the digital domain, for digitally perfect production studio quality mixing: no color bleeding, no ghosting, no artifacts . . .!

▶ **1.5MB Frame Buffer.** Display 24-bit, 16 million color images on your Amiga monitor. On a multi-sync monitor, you can even display 16 million color images in non-interlaced mode!

▶ **Realtime Framegrabber/Digitizer.** Freeze, grab and store (in standard 4096 or 16 million color IFF format) any frame from a "live" incoming RGB video source. Optional "RGB splitter" required to grab incoming composite or S-VHS video.

▶ **Flicker-Eliminator.** Duplicates and enhances the A3000's display enhancer circuitry. It even de-interlaces live external video! A must for any A2000 owner. Ask about our A2000 "genlock slot trade-up" program (in case your genlock slot is already used by something less exciting!)



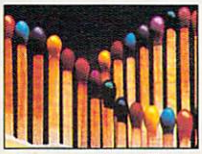
▶ **Simultaneous Component Video (RGB) Out, Composite Video Out and S-VHS Video Out.** Now, anything you can see on your Amiga monitor can be recorded on video tape, including animations, ray-traced 24-bit images and more!

▶ **Picture-In-Picture (PIP) Display.** Freeze, resize, rescale and/or reposition live incoming RGB video just like any workbench window at the double click of a mouse or the pressing of a "hot key". With a multi-sync all this can even be in rock steady de-interlaced mode. Unique "reverse-PIP" feature, even allows you to place a fully functional Amiga workbench (or other application) screen as a SCALE-ABLE (shrunk down!) and re-positionable window over full-screen live video.

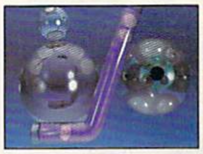
▶ To make sure you can take full and immediate advantage of every feature of your new *Impact Vision 24* video-station, we even include the following software with every unit:

- **Caligari™-IV24.** An exclusive version of the leading broadcast quality, 3-D modelling and rendering program. Use your imagination to model 3D, 16 million color, scenes. Use your digitized video images as textures to wrap around any object! The mind is the limit!
- **SCALA™-Titling.** Easy-to-learn, video titling package complete with lots of special fonts and exciting special transition effects. Turn your Amiga into a character generator.
- **MACROPAINT™-IV24.** A 2D, 16 million color paint program that lets you have fun creating or manipulating any 16 million color, 24-bit image.





- **Control Panel.** Provides full software control over all Impact Vision-24's numerous features. Use your mouse or simply press a (configurable) "hot key" to activate any feature.

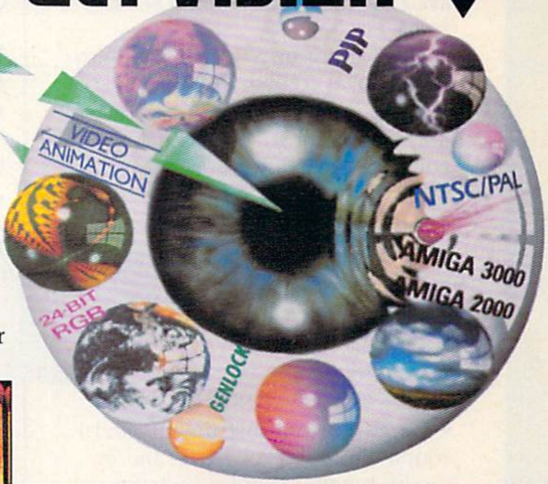




At GVP, we wanted to make a major impact on the use of the A3000/2000 by professional video enthusiasts. With the Impact Vision-24 we have!

For more information on how the **Impact Vision 24** can have a major impact on your video productions, call us at **215-337-8770.**

IMPACT VISION 24



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GVP Enters the SOUND ZONE

With the most powerful, comprehensive 8-bit Digital Sound Package to ever orchestrate an Amiga

Digital Sound Studio

The Affordable Answer to Your Audio Dreams

Record, Edit, Compose . . .

With a high-quality stereo sound sampler, A fast, powerful, easy-to-use sound editor, And a self-contained 4-track sequencer.

For all the sound effects and music you could ever imagine.

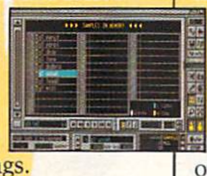
▶ **Record** sound samples from any source, including voices, noise, and pre-recorded instruments, to create your own instruments and effects.

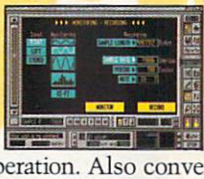
▶ **Edit** sounds quickly in real time. Add effects like reverb and echo, run sounds backward, alter wave forms, cut and paste sound segments, create loops, eliminate pops and scratches.

▶ **Compose** easily using the DSS 4-track sequencer and your Amiga or MIDI keyboard. Draw from up to 31 instruments at a time, in up to four octaves with 8 different variable effects. Mix and modify sounds in real time as you compose, through direct interface with the sound editor.

DSS Stretches the outer limits of 8-bit sound

- Create your own 4-track, self-playing musical compositions.
- Make soundtracks for home video, animation or visual presentations complete with voice-over, sound effects and music.
- Analyze voice patterns and stereo separation.
- Analyze graphic equalization of real-time sound.
- Remove "pops" from old phonograph recordings.
- Create custom instruments and sound effects by collecting and/or modifying pre-recorded instruments, voice, or sounds from any source, and use them in your own compositions.
- Save your sound and music to disk or send it out via modem for replay on any Amiga.





Check out these unparalleled features

✓ AmigaDOS 2.0 compatible; written in assembly language.

✓ Multi-tasking operation.

✓ 68020 and 68030 compatible.

✓ Comprehensive tutorial manual helps even beginners get started right away.

✓ Intuition-based graphic interface makes operation easy.

✓ MIDI-in capability.

✓ Direct interface between sequencer and editor.

✓ Hold 31 sound samples in memory at once – all shown on screen so they are easy to manipulate.

✓ Effects and processing capabilities include echo, mix, filter, re-sample, sound data inversion, playing sounds backwards, loops, fade-in/fade-out and more.

✓ Manipulate sound samples in real time, as you listen.

✓ Create sampled instruments with 1, 3 and 5 octaves.

✓ HIFI recording for highest quality playback.

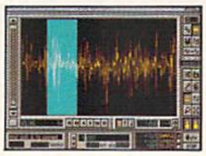
✓ Controls for faster/slower playback and filtering high frequencies during playback.

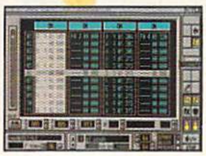
✓ Load and save samples, songs and instruments in multiple formats.

✓ Multiple effects for each note.

✓ Stereo and monophonic operation. Also convert mono to stereo or separate stereo.

✓ Auto-playing music modules.





✓ Real-time oscilloscope and spectrum analysis.

✓ Real-time reverberation.

✓ Graphic editing of wave forms through easy-to-use functions, including zoom in/out and precision controls for position, frequency and amplitude.

✓ Draw sound waves freehand using the mouse.

✓ Direct editing of individual sample numeric values.

✓ Maximum recording speed of 51,000 samples/second in stereo.

✓ Savable Preference settings.

✓ Saves in IFF, SONIX or RAW formats.

✓ Compatible with SoundTracker, NoiseTracker and SoundFX modules.

DSS 8™

DIGITAL SOUND STUDIO



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#1–AND DRIVE-ING HARD TO STAY THAT WAY!

IMPACT Series II

Only GVP* Factory Installed *A2000 HC8+/52Q, 105Q or 200 SCSI Hard Disk+RAM Boards have a track record this good—over 20,000 satisfied Amiga® users and now a* 2-Year *Warranty!

Don't waste your valuable time or money building a SCSI+RAM Controller from parts . . .

Because of our unprecedented pricing structure you can now get GVP's, brand name, *factory installed* A2000 HC8+/52Q, 105Q or 200 at a very competitive price.



▶GVP's A2000 HC8+/52Q, 105Q or 200 —THE SAFEST CHOICE

Look for the GVP Factory Installed Drive Seal . . . it's your assurance that your A2000 HC8+/52Q, 105Q or 200 has been installed and tested in GVP's own factory . . .

And the 2 year limited warranty protects you better *and longer* than any third party installed drive. And with third party drives you run the risk of a run around if anything does go wrong.

▶GVP's A2000 HC8+/52Q, 105Q or 200 —NOW EVEN FASTER WITH FAAASTROM™ 4.0

All A2000 HC8+/52Q, 105Q or 200 have been redesigned and equipped with GVP's newest fastest SCSI Driver—**FAAASTROM** 4.0. Plus, we've also doubled Western Digital's SCSI Controller clockspeed to 14Mhz—for a tremendous increase in speed . . .

▶GVP's A2000 HC8+/52Q, 105Q or 200 —JUST LOOK AT THESE FEATURES

- Custom chip design for the fastest possible data transfer rates and DMA performance—even in a multi-tasking environment.
- Easy-to-Install SIMM memory modules for configurations up to 8MB—and support BridgeBoard users with the 6MB FAST RAM.
- Support for virtually any SCSI device.
- Fastest and easiest SCSI installation possible.

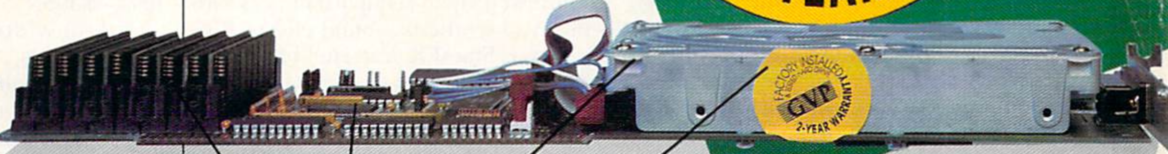
▶GVP's A2000 HC8+/52Q, 105Q or 200 —JUST LOOK FOR THE GVP *FACTORY INSTALLED* SEAL

Remember if the GVP *Factory Installed* seal shown in this ad isn't on your A2000 HC8+/52Q, 105Q or 200 box

. . . it isn't the fastest, most powerful, longest warrantied, safest A2000 HC8+/52Q, 105Q or 200 you can buy.

Ask for and accept only GVP A2000 HC8+/52Q, 105Q or 200 with the *Factory Installed* seal. For more information call **215-337-8770.**





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Consumers Circle 30 on Reader Service card.

OVERSCAN

News, New Products and Networks

Full Stage, Absent Audience

Oakland, Calif.—Display enhancers and accelerator boards stole the show at the October AmiEXPO this year. Unfortunately, a full regiment of third-party developers played to a scant crowd.

RCS demonstrated its **Fusion Forty 68040** for the A2000 (RS# 120), while *Computer System Associates* found a high-end audience for its **40/4 Magnum** A2000 accelerator/multipurpose board (RS# 121). Joining the '040 frenzy was *Great Valley Products* (RS# 122), which introduced its A3000-series **G-Force** board ($2799), a 28-MHz 68040 that holds up to 8MB of 32-bit DRAM. GVP's **Impact Vision 24** graphics board ($2199) also sparked a great deal of interest among attendees, as did its **Digital Sound Studio** ($125), an 8-bit stereo sound sampler.

Progressive Peripherals & Software (RS# 123) tossed its own **Progressive 040/2000 Accelerator Board** into the running. **Mercury**, an A3000 '040 board, is still waiting in the wings, as is **Zeus**, which incorporates SCSI II technology, resulting in an asynchronous 28-MHz 68040 for the A2000.

Progressive's **Video Blender** raised eyebrows, as did **3-D Professional 2.0**, which offers texture mapping, variable screen sizes, automatic database allocation, point editing and creation, Boolean merging, and real-time camera and object manipulation. **ProRAM 3000** can help you handle 3-D and other memory-intensive applications by adding 4 to 64MB of 32-bit memory to your A3000.

PP&S also spoke of the upcoming **Rambrandt**, a 24-bit graphics system for the A2000 or A3000. The dual-frame buffer system promises resolutions up to 1024×1024 per buffer in 16.7 million colors. The system includes a Texas Instruments TMS34020 40-MHz, 32-bit graphics processor and an optional 34082 coprocessor.

Digital Micronics (RS# 124) showed off the **DMI Resolver**, which brings 1280×1024 resolution to the Amiga, dramatically increasing the number of pixels displayed on screen. The Resolver uses 60-MHz Texas Instruments TMS34010 16-bit processor chips and can display 256 colors from a pallete of over 16 million. At least 10 popular 2-D and 3-D graphics programs will reportedly support the Resolver.

Expansion Systems (RS# 125) jumped into the graphics ring with its **Van Gogh Video Enhancer Card**, slated to provide a choice of four resolutions with a VGA monitor and up to 1020×768 pixels with an SVGA. Van Gogh requires a 1MB Agnus, or, if you prefer, the card allows you to adapt your system to accept a 2MB Super Agnus chip.

A Separate Reality

Brain Technologies (RS# 126) offered **Pix Lib** ($9.95), a picture-conversion and storage program with a library of 995 pictures, as well as **Mr. Robot's Speak 'n' Spell**, a vocabulary expander for ages six and up.

Newcomer *Pacific Digital* (RS# 127) displayed its wares—each selling for $29.95—in a black-shrouded booth. Investigation revealed **SpectrumFX**, which displays harmonic spectrums from a sound source; **VocoderFX**, which combines two sound files for truly alien-sounding results; and **MultimediaFX**, compressed video-sequence images with which you synthesize sound effects. Also inside was **StarsFX**, a starfield fly-by animation kit.

Carina Software (RS# 128) introduced us to **Voyager** ($124.95), a dynamic sky simulator that can identify and zoom in on stars, planets, constellations, and deep sky objects. In a similar vein, *Virtual Reality Laboratories* (RS# 129) showed **Distant Suns 4.0** and the latest version of **Vista Pro**, the company's landscape generator. ►



Overheard

The year 1991 is not the only thing that will end on Dec 31. So will Commodore's latest pricing promotion. If you've had your eyes on an Amiga, you may want to buy now while CBM is slashing prices 23 to 38 percent on selected models. Until the deadline, you can save $200 on the A500 Starter bundle (now $399). The basic 1MB A2000 is $599 off at $999, while the A2000 HD/P, with its software-installed hard disk, sells for $699 off at $1299. Finally, the 68030-based A3000 16/40, with 2MB of RAM and a 40MB hard disk, is now $1849 instead of the usual $2998. A one-year warranty and free pick-up and delivery service are included in the bargain.

Toasted

Not many Amiga products can boast a $900 price increase. But now, on the first anniversary of its appearance on the market, ***NewTek***'s **Video Toaster** can. Software version 2.0—a so-called "hardware upgrade on disk"—is the occasion; Toasters are currently selling at $2495, with a certificate for a free 2.0 upgrade. Thankfully, those who already own Toasters can upgrade for less—$395.

The new software promises 50% more effects, "whole new modes including real-time warping, soft-edge transitions, and organic effects," a revised object modeler, faster rendering, over 100 new LightWave features, greater integration of ToasterPaint and Toaster CG, and greater compatibility with other systems' files. A completely new manual with more tutorials will accompany the software. (RS# 115.) ***—BG***

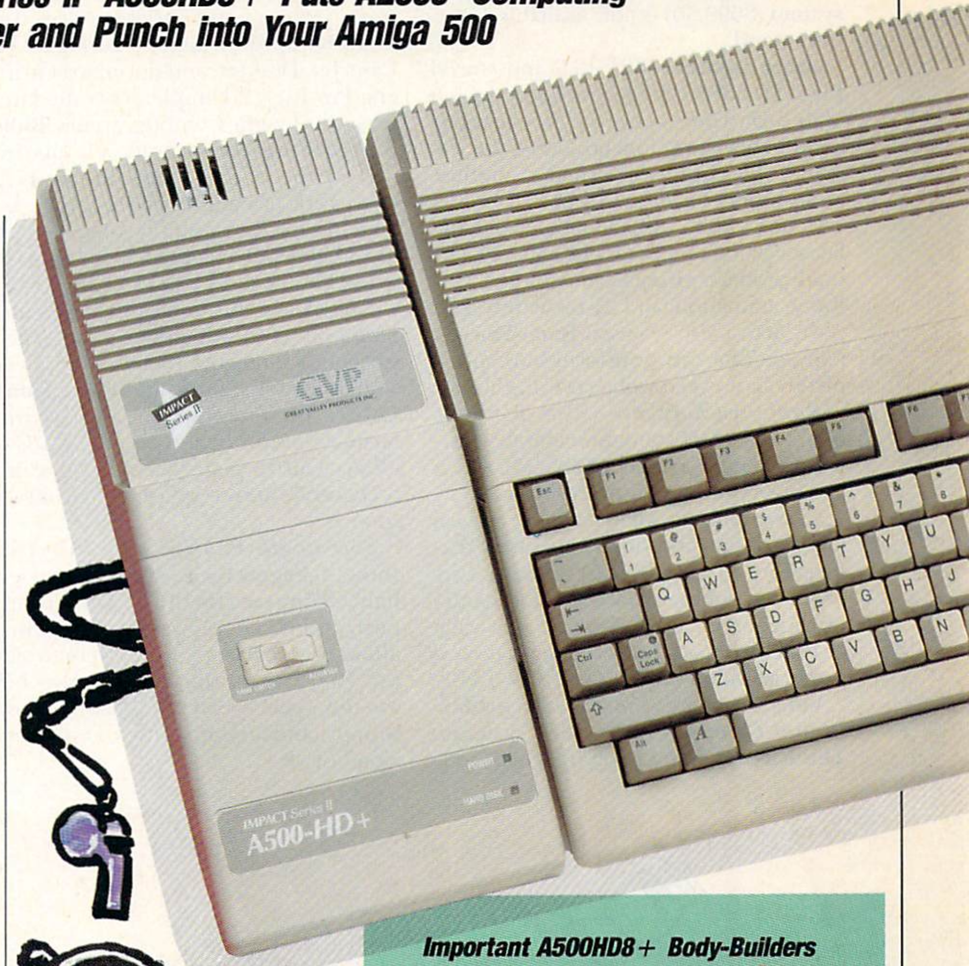
To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 120.

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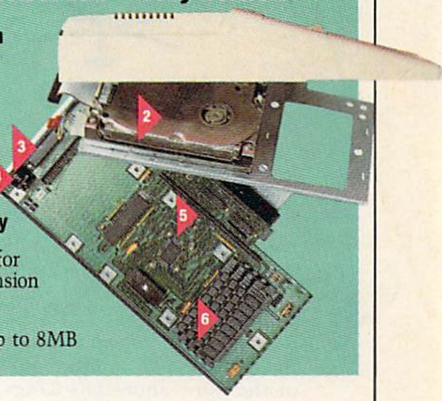
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A free-floating representative from *MegageM* (RS# 130) announced the upcoming release of **Fractal Pro 5.0**. This version supports either 68881 floating math chip or a 68040 accelerator. In addition, MegageM's **bar-code scanning system** ($699.50) is now available with a laser wand.

Axiom Software (RS# 131) announced **Pixel 3D 2.0** ($129.95), the latest version of its 2-D to 3-D converter. New features include beveling, functions that let you convert files from one format to another, and support for more formats.

Activa (RS# 132) demonstrated the latest version (1.4 Beta) of **Real 3-D.** The final product promises morphing, key-frame animation, and 24-bit texture support. Activa also released **Race Trace**, a package that can transform bitmapped pictures into vector objects for editing.

Radiance Software (RS# 133) announced its 3-D animation and ray-tracing package, **RayDance** ($99.95), which promises photo-realistic 24-bit images.

Those looking for true-color images for 3-D design and video were off to **Texture City** (from $139.95). Texture City (from the company of the same name) provides an array of 24-bit images, each of which comes in severe overscan and promises video-safe colors. (RS# 134.)

Video watchers were also intrigued by *Digital Creations'* new video switcher, **The Kitchen Sync** ($1895), which consists of two infinite-window time-base correctors on one card. (RS# 135.)

For Print

Professional Page 2.1, running in *Gold Disk*'s (RS# 136) booth, boasted landscape printing and variable offset controls for improved page centering on HP LaserJet, DeskJet, and dot-matrix printers. Pro Page 2.1 implements the latest version of Agfa Compugraphics Bullet font-scaling technology, claims improved speed, and offers on-line help. Gold Disk has authorized a service bureau for Pro Page output: Adage Graphics, 8039 Sepulveda Blvd. #424, Los Angeles, CA 90045, 213/216-2828.

Gold Disk also demonstrated **Video Fonts** ($99.95), which lets you create a variety of fonts and includes a conversion utility for scaling, and **Professional Calc**, a presentation spreadsheet with business graphics and a database. Calc allows you to translate numbers into 3-D graphs and to splash color on your reports.

Soft-Logik Publishing (RS# 137) showed **PageStream 2.2**, with an enhanced import module, printer support, and HPGL plotter support, which allows sign cutters and plotters to output PageStream documents. Also new are the Type 1, extended character-set support and an improved font/point dialog box. ►

Where It's AT

With or without a drive; populated or unpopulated with RAM; ***Interactive Video Systems*** makes its new autobooting **Trumpcard 500 AT** your way. Because the system is based on the emerging ATA (AT Attachment) standard widely used in the MS-DOS arena, it accepts any inexpensive 3.5-inch AT (sometimes called IDE) hard disk. The unit can accommodate 2, 4, or 8MB of autoconfig RAM (in standard 1Mx8 SIMM modules). Prices start at $275. (RS# 101.) —***BG***





ON-LINE SCAN

By Tim Walsh

Question any group of Amiga enthusiasts and you're bound to find that most cut their computing teeth on the best-selling computer of the past decade, the Commodore 64. In fact, many Amiga users can boast of closets and attics packed with Commodore 8-bit paraphernalia. Knowing that, I'd be remiss in my on-line surveillance duties not to acknowledge one of the most ambitious Commodore 64 emulators available—Version 2.0d of The A64 Package by QuesTronix.

Before you shudder at the thought of another half-baked C-64 emulator, be advised that The A64 Package is far more refined than its predecessors. Most C-64 emulators were fraught with incompatibility problems, nasty to install, and unstable enough to induce horrific crashes on even stock Amigas.

By contrast, The A64 Package is a breeze to install and is filled with enough error trapping to keep most system crashes at bay. And according to designer/programmer Cliff Dugan, it is easier to name those programs that do not work with the package (any that have disk fast-load routines) than those that do. Not only that, it works faster and is equipped with bells and whistles that owners of the real McCoy can only dream of.

The A64 Package goes beyond a stock 64 by offering an exhaustive list of complements. It includes a machine-language monitor, a Prefs mode, and utilities for copying to and from multiple combinations of Amiga and C-64 drives. Using the A2000's keyboard as a substitute for that of the 64 is admittedly confusing: quotation marks, dollar signs, and numerous other keys are in the "wrong" location. It is evident, however, that C-64 RAM and ROM locations are present and accounted for. Entering classic C-64 commands such as POKE 650,128 indeed causes the keys to repeat, and SYS 64738 does induce a system reset.

This freely distributable, copyrighted product is complete and well-documented. Registering your version is money well spent, for once you do so, you will receive a parallel-port interface that lets you connect such peripherals as Commodore 1541 disk drives and serial printers. (Send $39.95, plus shipping and handling, to QuesTronix, P.O. Box 340285, Hartford, CT 06134, 203/296-5331. A1000 owners require an extra cable, which is $20.00 more.)

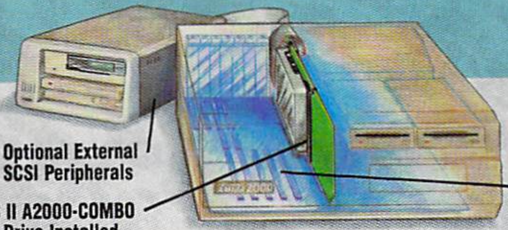
The documentation warns that the program is incompatible with the A3000. I found it to be troublesome under 2.0, but it was fine in 1.3 mode on an A3000/25 until I attempted to access the drives, which caused it to crash.

The A64 Package resides as two files in Library 33 of the Amiga area on GEnie: A64V2.D1.LZH, file number 12587, and A64V2.D2.LZH, file number 12588 (these represent disks 1 and 2, respectively). Be careful when scouting for this file on any of the nets, though. Earlier versions that lack sound support and other features are usually easy to spot—they appear as one file instead of two.

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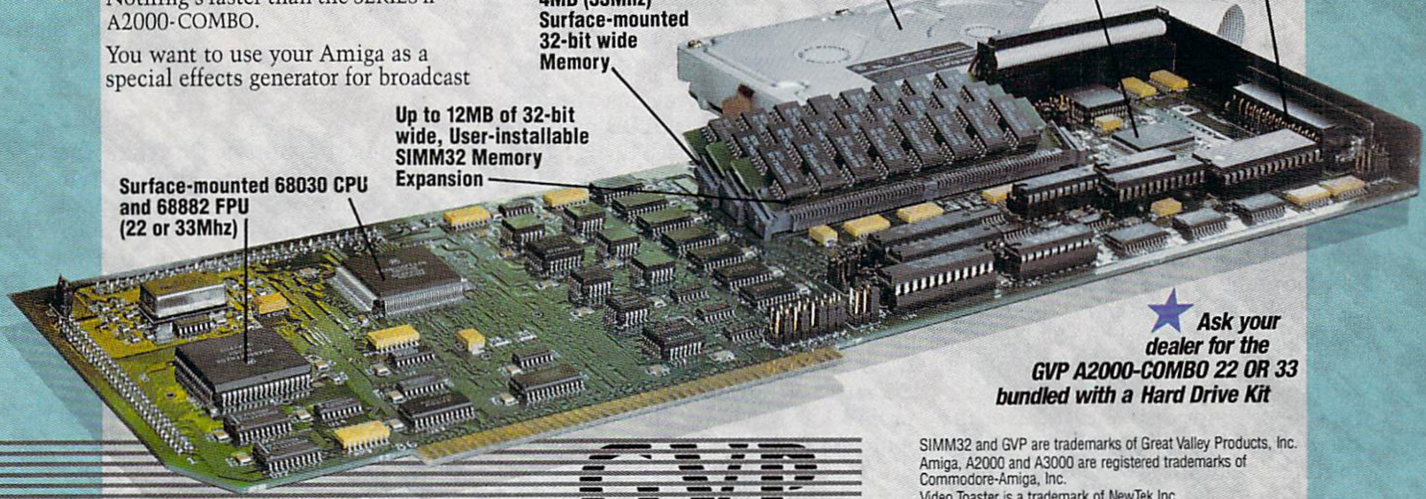
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OVERHEARD

At long last, Commodore has announced the release of AmigaDOS 2.04. You will find three upgrade kits at your local dealership. (The following price quotes do not include installation.)

A3000 owners can order disk-based upgrade kits (including disks and manual addendum) directly from Commodore by calling 800/448-9987 or by sending $19.95 plus $3 in shipping to Commodore Business Machines, A3000 Disk Upgrade, PO Box 18370, Memphis, TN 38181.

ROM upgrade kits for the A3000 are $45; for the A500 and A2000, $99; and for A2620/A2630 use only, $33.

HotLinks, an interactive program,assists you in exchanging data between other Soft-Logik programs and PageStream. With **BME**, a bitmap editor designed for use with PageStream, you can import IFF-ILBM and GIF files. Soft-Logik also announced a text editor called **PageLiner**.

SunRize Industries' long-awaited 12- and 16-bit digital audio cards were on display, with the 12-bit card ready for release. **AD1012**, with Studio 16 editing software, allows you to record hours of audio direct to hard disk. The card's built-in SMPTE time-code reader allows synchronization of digital audio to video tape. (RS# 138.)

Oxxi (RS# 139) announced the launch of **Aegis AudioMaster IV**, the next phase of its popular digital sampling and editing software, which promises to drive every parallel-port digitizer available for the Amiga. New features include digital filtering, real-time pitch bend, and the abilities to add up to 999 loops played in sequence and to substitute a single loop for repeated phrases.

SpectraColor, Oxxi's animation and paint program, now offers support for Black Belt Systems' HAM-E graphics expansion system. The HAM-E version can load any type of picture: 2-, 4-, 16-, 32-, and 64-color Extra_HalfBrite images, pictures in HAM mode, and 24-bit images.

Oxxi also showed **Presentation Master**, which can help you plan, compile, and display a complete presentation, including text, graphics, and animation. With the graphical outlining system, you place series of slides in a multi-level hierarchy on screen. The program outputs to both PostScript and nonPostScript printers.

The opportunity to play **Fantastic Voyage** drew gamers to ***Centaur Software***'s (RS# 140) booth. The game follows the original sci-fi film's plot, wherein miniaturized medical personnel try to heal a patient from inside the body. Also in Centaur's booth was ***Hologramaphone***'s **Pixound**, a musical software program that explores relationships between form and sound. While the booth housed stacks of **Colorburst** boxes, we have learned since the show that the display unit is now being reworked; current owners will be upgraded soon.

INOVAtronics announced its **HiQ A500 Tower** expansion kit for your A500. For $599.95, you get four A2000 100-pin card slots, coprocessor and video slots, two PC-compatible slots, a key/lock security access, and a 220-watt power supply. (RS# 141.) —*JJ*

Flexible Fonts

Apogee 3D Fonts were designed for broadcast video. According to developer ***Digital Arts***, you can enlarge the hi-res characters five times and greater with minimal distortion, and you can wrap, skew, and mold the fonts while preserving true curvature. Baseline identification allows accurate alignment, while dense and even distribution of vertices assures correct Phong shading. Available in all 3-D formats, the first set ($29.95), contains Helvetica, Times, and Courier faces (with numerals and symbols) in bold. Stay tuned for more on this! (RS# 114.) —***BG***

Down to BASICs

If you want to brush up on your punts and passes as well as your BASIC code, intercept **BASICFooTball** ($19.99, ***Mahoney Software***). In writing the software, the developer aimed to create not only a quality game written in BASIC, but also a learning tool. "I did not compile the game because I also wanted the user to be able to learn programming techniques," he stated. (RS# 103.)

On the count of four, ***Delphi Noetic Systems*** adds to F-Basic an ARexx port, high-level gadgets, and mouse up/down events, separately compiled modules, automatic checksumming, and more. **F-Basic 4.0** comes with a 200-page manual and a disk of sample programs.

The F-Basic Source Level DeBugger (SLDB) is also available in version 4.0. SLDB requires no knowledge of assembly language and runs in an Intuition-style interface. The upgrade facilitates the use of enhanced processors (68000 through '040) and coprocessors.

Both upgrades are AmigaDOS 1.3 and 2.0-compatible. Previous owners of F-Basic or the F-Basic/SLDB combination can upgrade for just $17.45; F-Basic itself is $99.95 ($159.95 with SLDB), and SLDB is $59.95. (RS# 104.) —***BG***

New Media

Flopticals—that's what you get when you cross conventional 3.5-inch floppy disks with optical tracking. Now, ***TTR Development*** brings high-density floptical technology to the Amiga with **Diamond Store 20**. Not only does Diamond Store accommodate 20MB floptical disks, but it reads and writes standard 3.5-inch double-density and high-density floppies for AmigaDOS and MS-DOS access (the latter by way of an IBM emulator). The unit, which incorporates an INSITE 1325VM floptical drive, is available in internal kit ($599.95) and external ($799.95) models. Both versions require an approved SCSI controller for operation; call TTR to verify your controller. (RS# 107.) —*BG*

Super Sleuths, Surrender!

Badger the butler. Chastise the chauffeur. Solve the crime in two hours—before the murderer escapes the house, that is—and you're a hero. Like a whole library of Agatha Christie novels, ***US Gold***'s new **Murder!** strategy game challenges you to solve not one but three million different crimes! Each case begins with a newspaper announcement of a murder; you alter variables such as date, type of house, victim, and difficulty level to determine the case specifics. Your tools are a map of the house and a notebook that automatically categorizes and cross-references the clues you enter. Case the place! (RS# 102.) —***BG***

Overscan is compiled by Barbara Gefvert, Janine Jackson, and Tim Walsh. Send your news, new products, and network information to Overscan, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. ■

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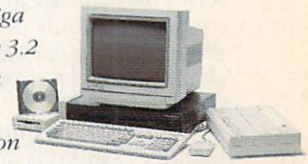


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Video Blender

Progressive Peripherals & Software

It's all in the mix.

By Steven Blaize

WHILE THE AMIGA has always been unique, no one could have imagined the large variety of kitchen appliances associated with the machine. Items with names such as the Video Toaster (NewTek), the Kitchen Sync (Digital Creations), and now the Video Blender seem to be proliferating. While users on other computer platforms may snicker at these names, the products certainly demonstrate how serious the Amiga developers are about producing professional-level video equipment.

Progressive Peripherals' Video Blender ($1495) is an external beige box (14×10×2 inches in size) that connects to any Amiga's RGB port. You also need to connect the Blender to the serial port with the included cable. To connect it to an A1000, you need either a gender changer or an A1000 serial cable. Overall, installation is simple and straightforward. The Blender does not have to be on when not in use; the Amiga RGB signal is passed through without interference.

The packaging and documentation of Video Blender are really first class. I have worked with MS-DOS, Macintosh, and Amiga products for several years and have always been disappointed by the caliber of Amiga documentation, but the Blender's manual is well written and easy to understand. It includes tutorials that work, thorough reference sections, a complete (and accurate) index, and even a glossary. The wire-bound volume also opens flat on your desk or workspace,making it exceptionally easy to use.

Squeaky Clean Signal

In the simplest terms, the Video Blender is a outstanding genlock with special video keying. According to the manual, "Keying is the method by which one video image replaces parts of another video image. Common keying methods include chromakey, lumakey, and, on the Amiga, background key." The Blender includes software that provides an excellent lumakey and background key. In addition, you can input an external key that can also be a chromakey.

The lumakey allows you to set an intensity threshold level so that the alternate video signal replaces all video areas above (or below). The background key replaces the Amiga's background color with alternate video. While these keys are not mutually exclusive and may be mixed, the results are hard to predict. In addition, all the keys may be normal or inverted, so that you can have incoming video replace all of the background color, or invert the process and see your video everywhere except the background.

Thus far, I have referred to video signals in the most general terms. This is because the Video Blender and its software provide limitless ways to combine and perform transitions to and from the four video inputs. These four video signals include one composite, one RGB, one Amiga graphics, and one generated local color. The local color is any one of 16.8 million colors and is instantly available. The composite source is the master sync signal and locks the Amiga's signal to it. This composite source can be either a video camera or a tape player.

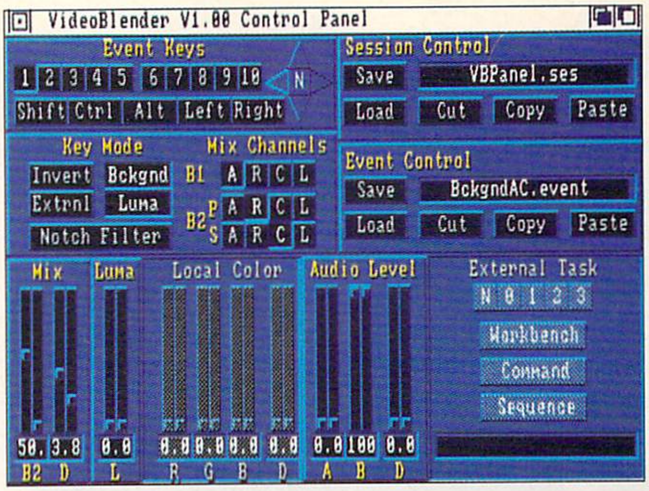
While the company claims that the tape player (master sync) does not require time-base correction, many consumer-grade VCRs do not output a clean sync signal; therefore, a camera is a better alternative. Furthermore, even many professional decks present sync problems during fastforwards and rewinds if the tape deck is not time-base corrected. This is not a failing of the Blender, but a problem with genlocking the Amiga signal with any VCR.

You can use the Blender's Black Burst out in order to sync external video such as a genlockable RGB video camera or a time-base-corrected and transcoded video-tape deck. The reason you must transcode this alternate source is that the Blender's second external-video input is RGB, which must also be in sync with the master sync signal. This RGB input may also come from one of the new 24-Bit framebuffers such as Firecracker 24 (Impulse), Colorburst (M.A.S.T.), and the yet-to-be-released Rambrandt 32-Bit card from Progressive Peripherals (see sidebar). These should pose no problem as long as they sync to the Amiga, which is locked to the master sync.

Depending upon what kind of framebuffer you use, you may need a special (inexpensive) RGB-breakout cable to connect to the Video Blender. All the Blender's video connections are professional BNC connectors. The company thoughtfully includes RCA-to-BNC adapters in the box in addition to a composite (master signal) pass-through and two composite outputs. One is for the output tape recorder and the other for the output viewing monitor. Since the Blender does not have a transcoder and it allows composite video mixing, the output is only composite video. This is the only reservation I have about this device.

It is an impressive fact that the Video Blender takes an RGB genlockable video as a second source; it is the first Amiga product of this class to handle

For information about the vendors of products reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 120.



The heart of the Video Blender.



Putting together a script is a point-and-click operation.

professional-level, color-separated video signal. The genlock signal from the Blender is one of the best I (and many of my professional associates) have seen in an Amiga peripheral, including the Video Toaster.

The rest of the complement of physical connections and controls include two stereo-audio inputs and level controls, one stereo-audio output, and controls for Hue, Saturation, and Contrast of the composite input only. The Blender's software provides for audio mixing and fading, a minimal but nice addition to the setup.

The software provided with the Video Blender is also unique. VBPanel controls the hardware and defines specific events such as mixing two video signals or genlocking a title over a video picture. VBPerform executes events after VBPanel defines them. VideoScriptor scripts video events, delays, video transitions (algorithmic or custom), and even audio mixing. You can use the MixMaster tool to create custom animated transitional wipes, which brings us to Wiper, a program that creates over 24,000 algorithmic transitional wipes. Finally, Slides performs scripts (from VideoScriptor) of pictures, animations, video events (fades and mixes), and any custom transitional wipes.

Getting Wiped

The Video Blender performs transitions by applying a two-bit plane (black and white or background and all other foreground) to key together two of the four video inputs. Replacing the background color is one video source and in place of all other colors is the second source.

You can create these transitions with Wiper, which uses algorithmic calculations to achieve the transitions. You can select from up, down, left, right, box in, box out, circle in, radar, twist, and many more. Add to this the parameters of 1 to 9 columns and 1 to 9 rows, as well as reflections on the X or Y axis, and you have thousands of possibilities, all subject to instantaneous generation. Some of the more complex transitions, however, run too slowly for professional use—even on an Amiga running with an 68030 accelerator.

You can also use MixMaster to create transitions. This hybrid paint program uses algorithmic and custom bit-mapped brushes. The program paints in only two colors, since that is all that the transitions use. Some of the standard paint tools included are anim-brush painting, rub through, and copy previous frame. Unique features such as cycle-brush painting, vignette for soft edges, fills for zooms, and scan-line and waterfall transitions round out MixMaster, which I found both powerful and fun to use. The tutorials are adequate, but they do not fully indicate the real depth of the program. Curiously, I found that the mouse-response time, although workable, was very slow in view of the fact that the program is only two-color.

It is important to remember that these two programs are only tools to create transitions. You can just as easily use DPaint or other paint programs to create custom two-color animations for transitions. In fact, because you can use the Amiga signal as an external key in this manner, you can draw a foreground color brush in DPaint and use it to create a live, moving video window.

VBPanel (see Figure 1) is the heart of the Video Blender. This software controls the amount of mixing and determines which of the video and audio sources are to be used in the mix. You can store up to sixty audio/video events in a session. Once defined, these events (including timed fades) are all available instantly via function key or combination Shift/Ctrl/Alt/LeftA or RightA and function key. You can save and recall any number of sessions (sixty events) from your hard disk.

VBPerform is a very small program that allows you to use any of the sixty events without degrading performance. VBScriptor (see Figure 2) provides a point-and-click method of selecting video and audio events, playing animations, and displaying pictures. These scripts then play with the Slides program. The power to script, fine tune, and replicate your timed transitions ►

between video has been very weak on the Amiga until now.

Tomorrow's Blend

The unique features, name, and marketing of the Video Blender may lead you to believe that it is similar to the Video Toaster. It is not. It can handle only one composite video input and one RGB video input. This RGB input must also be genlockable to the master composite input. In other words, the Blender is not a video switcher, a capability built into the Video Toaster.

Progressive Peripherals has told us it plans to release a video switcher that will permit time-base-corrected video to be passed to the Video Blender for transitional effects. It also plans to release a 32-bit framebuffer that will also be able to pass RGB to the Video Blender. These devices should give you many of the capabilities of the Video Toaster and much more. It should be emphasized that neither the switcher nor the framebuffer were available for release or evaluation at press time.

This powerful box and software deserve careful consideration. While it is a bit pricey by Amiga standards, the genlock is professional grade, the controllable fades on both audio and video are some of the best I have seen, and the custom keying allows video effects that cannot be duplicated by other devices.

X-OR

Dr. T's Music Software

Get a grip.

By Steve Quinzi

FOR MIDI MUSICIANS, an ever-growing personal collection of software is particularly insidious. As we add more modules and more sounds, it becomes increasingly difficult to manage, until you practically lose control. If you know all too well what I mean, you should consider investing in a universal patch editor/librarian, a program that stores all of your sounds, manages your system, and forces you to get organized in the process.

X-OR ($325) is the second such product to arrive on the Amiga scene (the first being MIDI Quest, reviewed in *AmigaWorld*, Nov. '90, p. 98). Although a relative newcomer to the Amiga, X-OR is an established program on the Atari and IBM platforms. The Macintosh version has just now become available.

X-OR is similar to a host system (not to be confused with an MPE host) that utilizes modules called profiles to communicate with various MIDI devices. Each such device requires its own profile (there are nearly 100 available as of this writing). Interestingly, Dr. T's created many of X-OR's profiles with an Atari (gasp!) profile editor. This is possible because all profiles (and patch files as well) are freely transferable among computer platforms.

Nothing Off the Rack

Before you can use X-OR, you have to customize it so it will work with your particular assortment of gear. First, identify the profiles corresponding to your equipment and install them on your work disk or hard drive. (The package comes with two disks full of profiles, and Dr. T's posts new ones on its BBS as they become available.) This configuration is your default setup file.

You can fine-tune your system

Continued on p. 22.

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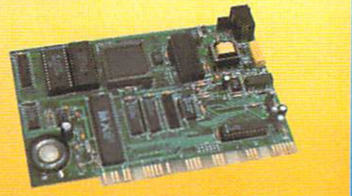
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From p. 18.
through the Instrument Setup window, which displays a complete list of your devices (synths or other MIDI modules). Here you set the system-exclusive and MIDI-receive channels for each of your devices. Incidentally, if you don't have a programmable MIDI patcher yet, now is the time to get one. While the program will work without one, its efficiency is then greatly diminished.

In the Performance window, the center of all activity in X-OR, you will find representations of various data types (singles, multi's etc.) for each device. Click on any of these, and you are in communication with that device. Choose Get Bank, and the program retrieves the current internal bank and displays it on the screen.

You can "play" any of the patches in the bank by selecting it and holding down the right mouse button. The left/right position of the mouse determines the scale step, and the up/down position determines the velocity. You can also send controller data by holding down the left Amiga key and the right mouse button. This is a nice play feature. Of course you can also play the sound via a keyboard controller or sequencer by selecting Merge from the setup menu.

You can open other banks of sounds from disk, send them out to the synth, and create new banks by copying patches between banks. Since X-OR only deals with one data type at a time, clicking on a different device causes all banks pertaining to the previous data type to disappear. This is not permanent, however; clicking on the first device brings it all back on screen.

If you choose Get Performance Patches, X-OR will go to each device, one after the other, and retrieve the currently selected patch from each synth. Some devices, such as the Casio VZ1, will not respond to a dump request. If X-OR encounters one of these uncooperative devices, a requester suggests that you initiate a dump from the machine itself. You can then save this configuration as a Performance.

If you enable Perf. Bank, X-OR includes the instrument's patch bank in the performance. Because the program does not save bank files in performance files, you need to save all of the patch banks individually before you save the performance. Then, when you load a performance, the program automatically locates and loads the patch banks into their respective synths.

Patch-Work Library

X-OR's mass-storage mechanism, or library, holds any number of patches as long as they are the same data type. When you select Open Library, X-OR creates a library for the currently selected data type. Then, you can copy individual patches into the library by dragging them from a bank window.

The program checks for duplicates on input and not only refuses to copy a patch which already exists in the library, but also alerts you if you try to copy a patch with the same name (but different data) as one that already exists. The program asks if you want to rename the new patch or save it as is. X-OR makes no provision, however, for a patch with the same data as one already in the library but with a different name—a more common duplication error.

Before X-OR actually copies a patch into the library, it invites you via re- ►

quester to assign one or more keywords from a vast selection under eight headings. Each section (Categories, Instruments, Percussion, Qualities, Materials, Techniques, Audio/MIDI, and Sound Effects) contains numerous keywords. Under Categories, for instance, you will find general instrument types such as strings, brass, and so on. Instruments comprises specific instrument names, and Qualities contains descriptive words like acoustic, electric, and ethereal. You can also write and attach comments.

Keywords really help you organize your sounds. For example, if you want to review your entire collection of string sounds, select the keyword Strings, and the program shows you all the patches corresponding to it. Going one step further, you could assign some of them the Acoustic keyword upon input. Then, selecting the Strings and Acoustic keywords reveals only the acoustic string patches. You can even copy entire banks into a library by using the Bank->Library command. With this operation, the program assigns all of the bank's patches the same set of keywords as it copies them. If you want to see the entire library without regard to keywords, select Show All, and X-OR ignores the keywords.

You can indicate whether you want a library's patches sorted by name (alphabetically) or by date. To say the least, X-OR's library functions, including keyword combinations and text-string search-and-comment fields, offer an extremely comprehensive system for categorizing and locating patches.

Patch editing is available for most of the MIDI devices supported by X-OR's profiles. Simply click on a patch in a bank window or library, select Patch Edit Window, and an editor appears. As you might expect in a system such as this, the editors follow a rigid format. You control all parameters through data sliders, text boxes, or graphic envelopes.

The advantage of this is consistency. As you go from one editor to another, you'll find that everything looks familiar. The disadvantage is that some editors look a bit scattered; sliders for instance, tend to take up a lot of room, where in some cases data boxes might keep things more consolidated. What's more, you can only express the editor's envelopes graphically. Since most sound modules express envelope data numerically, I think it only makes sense to include numerical data with graphics.

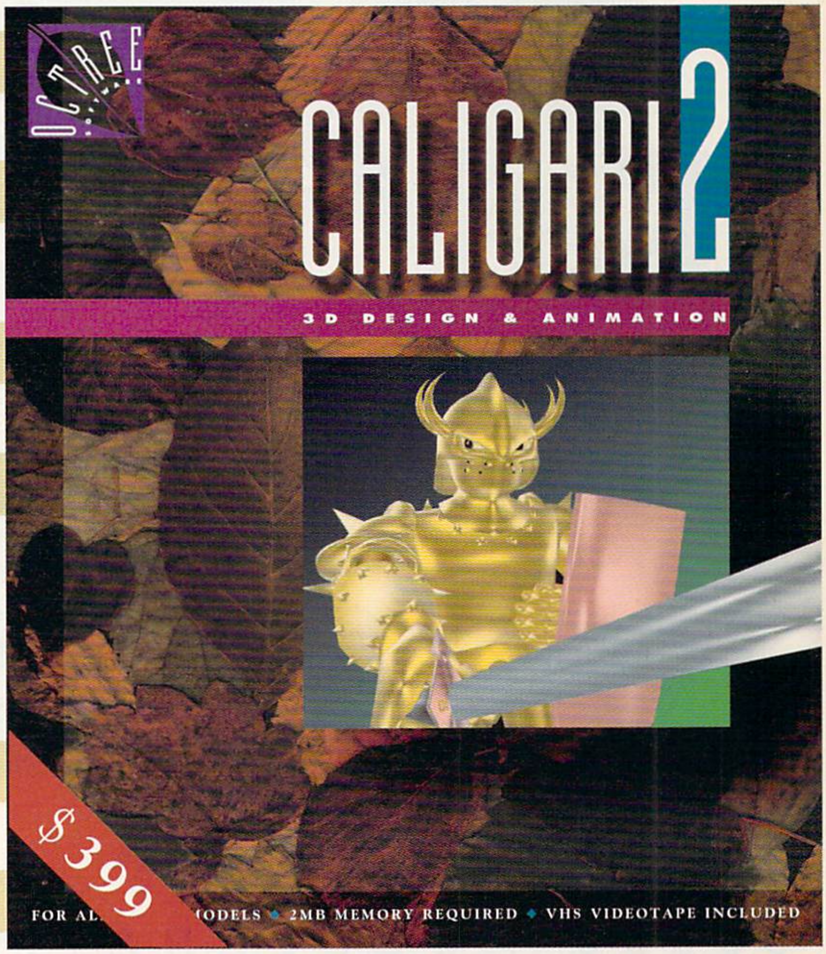
Despite these shortcomings, X-OR's editors are quite powerful. For example, the multipatch editors work interactively with the single patch editors—a nice feature. You can copy parameter settings either within or between patches, which is very handy. In addition, you can copy certain parameter settings from one patch to every other one in a specified bank. As the manual suggests, this is a good way to copy performance parameters (such as in the DX7II) to every patch in a particular bank.

No patch editor/librarian would be complete without random patch generation, and X-OR is no exception. To create a bank of random patches, you need to designate two source patches. There are four algorithms to choose from: two "Blend" algorithms for averaging parameter values between the two sources, and two "Mingle" functions for redistributing parameters between them. There are three options ►

REALITY REFINED

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governing data for use in this process: All Parameters, Raw Data Bytes, and Mask Parameters.

Owners of Dr. T's KCS will be happy to know that X-OR runs as an MPE module, although you need at least 2MB of RAM for this to work. At this time there is not a lot of interaction between X-OR and KCS, but just having all of your sounds on line and ready to go at any time while you are sequencing should increase your efficiency level tremendously.

X-OR is a very powerful program, and anyone with more than a few MIDI devices would benefit greatly from using it. It's flexible and remarkably easy to use. I don't recommend getting rid of your single machine editors yet. For concentrated editing, these are still your best bet (and if your other editors are from Dr.T's, you can load the sounds you create with them directly into X-OR anyway). But if you need to find, edit, and manage your sounds quickly and elegantly, X-OR is for you.

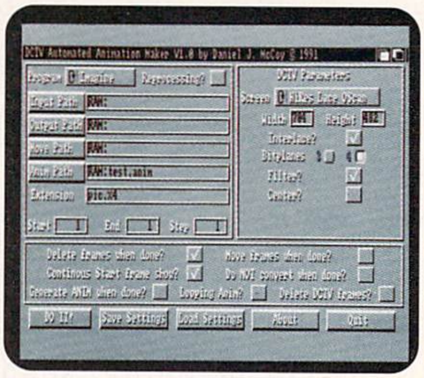
CanDo 1.5

INOVAtronics

And how!

By Geoffrey Williams

WHEN INOVATRONICS FIRST introduced CanDo ($149.95), it was a powerful and exciting product, but it also had a number of shortcomings. The developers candidly admitted that initially they weren't really sure what people wanted. Well, they've been listening, and have worked hard to



DCTV Automated Animation Maker.

incorporate suggestions from the masses into version 1.5.

Frankly, I am impressed with version 1.5. In fact, if you take the time to learn CanDo 1.5 and ARexx, there is very little that you cannot get your Amiga to do. You can easily create your own front-end control panels to completely automate ARexx-compatible programs, or even create your own customized interface. You can create stand-alone programs, complete with close gadgets, multiple windows, drag gadgets, and everything else you expect from an Amiga program. You can create interactive demonstrations. And best of all, you can do it all without programming.

Snowball Effect

Before examining the program's new features, let's take a look at how CanDo is affecting the Amiga community. With the release of 1.5, I'm seeing quite a few powerful CanDo programs developed on the bulletin boards. A good example is Dan McCoy's DAAM. This DCTV utility (see illustration) lets you completely automate the process of creating DCTV animations. DAAM waits for the rendering of each image to be completed from Imagine, LightWave, or VistaPro, converts the 24-bit image to DCTV format, deletes the original frame, compiles it into an

Continued on p. 102.



LEANDER

Thanatos lurks in his lair, bathing in the power-giving life-force he is sucking from Princess Lucanna.

Princess Lucanna is dying: Imprisoned in the Sphere of Depletion her strength will soon be gone.

Meanwhile, Leander – Captain Of The Guards – kneels before his master seeking advice. He is told: *The princess is the balance between good and evil, if she dies, good dies and evil shall engulf the land.*

As Thanatos' power grows, the world succumbs to his evil grasp; Leander now has to face and conquer dangers beyond his darkest dreams before he can free the princess and save the land.

*You play the part of the Princess as she hangs around inside the Sphere Of Depletion waiting for Leander to rescue her. Will he make it?
Or will you spend the entire game doing nothing but having your life-force sucked?

Leander: Where heroes Sphere to tread!

*Psygnosis reserve the right to amend this storyline.

Screen Shots from the Amiga version.





BARBARIAN II

Necron's back in town and he wants revenge. Only you – in the guise of Hegor the Barbarian – have the courage, strength and stupidity to face the challenge:

It's time once again to don your dented hemlet, tie your sweaty breechcloth, sharpen your rusting sword and move your big feet in the direction of danger.

Forests, caves, dungeons, castles and temples await your barbaric exploration, each is infested with deadly inhabitants and devious traps ready to terminate your lowbrow activities.

Featuring 2,000 frames of sprite animation, 32 colours on-screen, parallax scrolling, 6 levels of continuous arcade/adventure action, over 1 megabyte of fully-animated sprites, 50 divergent enemies, Magic & Health Potions to help you on your quest and a plethora of unique weapons to find and use. **Barbarian II** is:

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Screen Shots from the Amiga version





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The *AmigaWorld* Experts' Choice Awards

PRODUCTIVITY SOFTWARE



SPECIALIZATION. IT'S HAPPENING in every arena, and *AmigaWorld* is no exception. In the past, we have included the entire realm of Amiga software in selecting winners of the *AmigaWorld* Experts' Choice Awards. This time, however, we specialized, and in future issues we will present similar awards focused on particular categories or product types.

Productivity software is the name of the game for this round of votes. We're not talking about the software that makes our creative juices flow; we're talking about the stuff that keeps us organized, efficient, and productive. We're talking about the support roles.

To help you cast your support roles with the best possible talent, we assembled a panel of knowledgeable, experienced Amiga software users. The panelists are professionals who know the productivity software field in depth and use the products extensively. These folks have seen everything there is to see—including the very latest and prelease products—in the categories in which they voted. We gave these qualified computerists a list of 12 categories and subcategories and asked for their top three picks in each. (In some cases, the panelists could muster enough enthusiasm for only one or two titles.) We then tabulated the votes and averaged them to find the winners.

In some categories, such as professional accounting, CAD, personal database and desktop-publishing software, spreadsheets, and text-only word processing, the top two programs were closely tied. In the professional-database and graphics word-processor fields, on the other hand, the winners all but buried the competition. This year, we saw some old standbys fall by the wayside and others hang on—if only tenuously. And, for the first time, we also saw a package appear in more than one category. You may be surprised by the outcome!

To contact developers of the products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 120. ►

EXPERTS' CHOICE PANEL:

Doug Barney, Ron Bissett, Barbara Gefvert, Janine L. Jackson, Jeff James, David Johnson, Morton Kevelson, Linda Laflamme, Sheldon Leemon, Loren Lovhaug, Gary Ludwick, David Spitler, Lou Wallace, Tim Walsh

ILLUSTRATED BY BOB SCHUCHMAN

ACCOUNTING

"The reward of energy, enterprise, and thrift—is taxes."
—William Feather

PERSONAL

Phasar 4.06
Marksman Technology/Terrific Corporation
$89.95

"No contest here. I use Phasar for both personal and business checking accounts. It has features that some of the professional-level packages would do well to emulate—or steal!" —GL

"It goes way beyond checkbook balancing to handle all kinds of financial information such as budgeting, loans, net-worth statements, and so on. You can almost use it as a stand-alone tax package, although it generates data that you can import directly into a tax program." —SL

PROFESSIONAL

Service Industry Accounting
Brown-Wagh Publishing
$395

"Just the ticket for a lot of small business owners. The bin full of customer files is an analogy that people can relate to easily. The program works well and is simple enough for non-CPA types to understand." —DS

"Very Amiga in interface and usage, and the only choice for service-type businesses that sell time rather than widgets. SIA has pretty much automated not only my bookkeeping chores, but also my billing. It does everything well, but does not offer a payroll module." —GL

2. The Accountant
KFS Software
$299.50

"Both The Accountant and Service Industry Accounting are excellent packages, depending on what you require. The Accountant is not easy or pretty, but then neither is Arnold Schwarzenegger. It does, however, have the muscle for almost any accounting task you can think of." —GL

3. B.E.S.T.
Software Technology
$199.95

"This continues to be the most thorough accounting package for the Amiga, despite spotty support and updates. Just where is that payroll module we've been promised, anyway?" —SL

CAD

3-D meets CAD: At last!

X-CAD Professional and X-CAD 3D
Applied Vector Technology/ American Software
$599 and $499
with
X-Shell
GrafX Computing
$199

"My first choice for CAD at this date is the combination of X-CAD Professional, X-CAD 3D and X-Shell. X-Shell runs the CAD software in an overscan window, allowing you to position the menus off the drawing area. X-Shell's menu system allows easy and in-depth access to X-CAD's considerable command options. The X-CAD 3D's ability to save accurate drawing information in Turbo Silver format puts a great deal of graphic power in your hands for very little money." —RB

2. DynaCADD
Ditek International
$995

"DynaCADD is undergoing changes that may make it my first choice in the future. The program is available in either IBM or Amiga versions. As with WordPerfect, in DynaCADD you can easily transfer files between systems without the use of translation software that tends to lose information." —RB

"The first stab we've seen at a really professional-quality CAD system for the Amiga. Hopefully, the promised update will take care of early bugs and add needed features." —SL

3. IntroCAD Plus
Progressive Peripherals & Software
$99.95

"I rarely need all the power of professional CAD software. Instead, I find it necessary to make quick and dirty drawings to get my ideas across. With its fluid, idiot-proof interface, IntroCAD lets me sit down and work almost immediately." —DJ

DATABASES

Amiga database management is up to industry state-of-the-art standards.

PERSONAL

Superbase Personal 2
Software Publishing

Editor's note: At press time, we learned that Software Publishing has ►


WHAT THE CRITICS SAY – "A FIRST CLASS CONVERSION"
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VOLFIED
THE ULTIMATE TAITO COIN-OP CONVERSION
"VERY SLICKLY CODED WITH TERRIFIC ATTENTION TO DETAIL - A BRILLIANT CONVERSION"
Use your planning skills and put them into quick action, as you fight through 16 levels of challenging gameplay crammed with masses of enemies, special and hidden bonuses.
Pick up extra powers like lasers, power-ups and time stops and face the ever changing massive "Boss Alien".
VOLFIED: READY TO ATTACK YOUR NERVOUS SYSTEM!
VOLFIED: SKILL, STRATEGY AND EXTREMELY QUICK REFLEXES
VOLFIED: AMAZINGLY SIMPLE IN CONCEPT, INCREDIBLY ADDICTIVE TO PLAY
VOLFIED: YOU HAVE TO SEE IT TO BELIEVE IT
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discontinued Personal 2. You can probably still find it through retail channels, however—often for less than $100.

"A good subset of the professional version. Here's hoping that it remains available after its recent acquisition by Software Publishing." —SL

"For any database that only I will use, Superbase is the answer" —DS

"Inexpensive and useful, Superbase Personal is an excellent choice for a stand-alone database. It has a great deal in common with Superbase Professional, making it a perfect tool for prospective Pro users to cut their teeth on." —JJ

2. Pen Pal
SoftWood
$149.95

"If I am doing a simple, flat-file database that will be used by others, I choose the database software included with Pen Pal. The program is easy to understand, easy to use, and the help files are great." —DS

"Although not as fully featured as some other personal database programs, the database portion of Pen Pal is a model of user-friendliness and efficiency. Tight integration with the word-processing side of Pen Pal makes it a mail-merging wonder, perfect for address labels and other printing functions. And the beginner won't be lost, thanks to Pen Pal's outstanding documentation and on-line help feature." —JJ

3. Organize!
Micro-Systems Software
$59.95

"No longer a pace setter in the personal database arena, Organize! is nonetheless a well-balanced performer at an unbeatable price." —JJ

PROFESSIONAL

Superbase Professional 4
Software Publishing
$495

"Superbase Professional 4 so outclasses every other Amiga database product that there is no reason to consider anything else. While some might argue that SBPro's programmability and relational facilities represent overkill for most people's needs, I argue that you should not sacrifice its speed and elegance just because you may not use all it offers. The VCR-like control panel, the elaborate form designer, and the ability to create new files and complex queries with just a few mouse clicks make Superbase Pro 4 one of those rare products that is appropriate for beginners and advanced users alike." —LL

"This time-tested product is solid, stable, and state-of-the-art. The Amiga 4.0 version is every bit as good as the Windows version that recently induced Software Publishing to buy Precision Software for some $75 million." —SL

"Easily the most feature-laden productivity program ever released for the Amiga, Superbase Professional is a must for serious database work. With its powerful form designer, extensive programming language, and cross-platform compatibility (with the MS-DOS/Windows 3.0 version), SBPro is truly the industrial-strength choice for relational database management." —JJ

"No other program offers the power and versatility of SBPro. The program makes it easy to manage mountains of data and offers a variety of report options. Without it, I would have been buried under paper long ago." —JLJ

"Superbase is not the easiest program in the world, but once you have figured out how it works and get used to its power, you will never want to go back to anything else." —DS

2. MicroFiche Filer Plus
Software Visions
$179

"A truly unique and useful product, with the operational simplicity of a microfiche. The addition of more powerful features would make this an even more attractive choice." —JJ

DESKTOP PUBLISHING

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PERSONAL

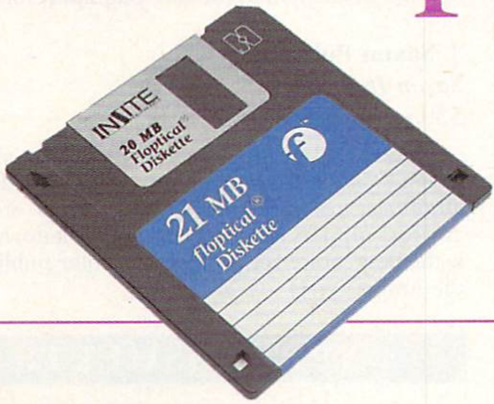
PageSetter II
Gold Disk
$129.95

"PageSetter, with its scalable outline-font technology, remains a terrific bargain for the casual user who wants to print an occasional sign or flyer. For many people's needs, it is just as good as Professional Page. The upcoming version 3, with support for color output, structured clip art, and PostScript output, is going to include even a word processor and spelling checker." —SL

"A program that can truly be called "Son of Pro Page," PageSetter II packs quite a bit of publishing power for a penny-pinching price. Most of what makes Pro Page so much fun to use remains intact in PageSetter II." —JJ ►

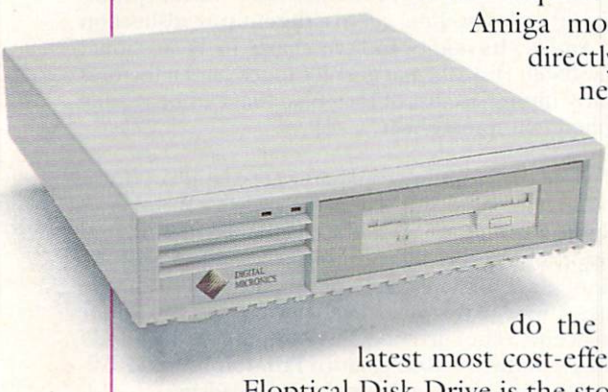
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2. Pelican Press
Pelican Software
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"With gobs of painting tools, heaps of clip art, and a keen interface, Pelican Press makes publishing color flyers, banners, and calendars so easy and so much fun that it must be illegal. Even the stolid high-end desktop-publishing packages could learn a few things from Pelican Press." —JJ

"It seems pretty obvious that Pelican Press is going to capture this market; it is at the same time more powerful and easier to use than PageSetter." —DS

3. Comic Setter
Gold Disk
$69.95

"Some programs are simply too much fun to resist. Sure, Comic Setter has a kludgy interface and runs like molasses, but who cares? Holy HAM mode, Super Agnus, it lets us create our own boffo comics!" —JJ

PROFESSIONAL

PageStream
Soft-Logik
$299.95

"PageStream is the best. More fonts and graphic-import capabilities, better layout flexibility, an intuitive user interface, and precise, object-oriented graphics tools make it my choice." —LL

"PageStream really goes the extra mile, with support for PostScript font technology as well as for Compugraphics, and dozens of text and graphics import formats. Besides, the program is just plain easier to use than Pro Page." —SL

"PageStream has been updated more than any other publishing program in the Amiga market, and it shows. With a gargantuan features list, impressive support for image and text formats and other publishing platforms, and an intuitive "no-frames" interface, PageStream is the new standard in professional Amiga desktop publishing." —JJ

"When I needed a desktop-publishing program, PageStream initially won because of its price. Now I love it for its comprehensive import capability, great text and graphics handling, and, most important, outline font support that gives me excellent output on a laser printer without PostScript." —DJ

2. Professional Page
Gold Disk
$295

"Professional Page easily has the best interface, documentation, and stability of any serious Amiga desktop-publishing program. Direct support for Pantone color matching is a boon, although Pro Page has absolutely the worst support of all the many image and text formats available on other platforms." —JJ

"This program is vastly superior to Aldus PageMaker in the IBM arena. The rotatable text and graphics, Pantone colors, and built-in text processor make it a complete publishing tool." —RB

"It is not easy to learn, but the power you get makes the investment worthwhile. Pro Page seems to have all the features I want when I want them. I like the keyboard equivalents and the Compugraphic fonts." —DS

3. Saxon Publisher
Saxon Industries
$395

"Speed and gorgeous color-separation ability are Saxon Publisher's strong points. Although saddled with an offbeat interface and cursed by a lack of graphics and text support for other computer platforms, Saxon is the best choice for professional color publishing on the Amiga." —JJ

SPREADSHEETS

"I have to say, spreadsheets are an area where the Amiga needs help." —DS

Advantage
Gold Disk
$199.95

"Although woefully underpowered when compared to Quattro Pro, Lotus 1-2-3 and Microsoft Excel of the MS-DOS world, Advantage is the closest thing yet to a decent spreadsheet on the Amiga. Its ability to save charts in Professional Draw (Gold Disk) format is a nice touch, and it features a fairly impressive list of formulae that can be readily applied to a spreadsheet." —JJ

"While the graphing capabilities of MaxiPlan (Intuitive Technologies), Superplan (Progressive Peripherals & Software), and Advantage are laudable, they are not extraordinary. Terrible printout capabilities and the lack of three-dimensional consolidation are just two reasons why real spreadsheet mavens do not suffer Amiga envy. The current best is Advantage, which can't hold a candle to Excel, Quattro Pro, Improv, and 1-2-3 for Windows, but is a decent basic spreadsheet." —LL

2. MaxiPlan
The Disc Company
$99

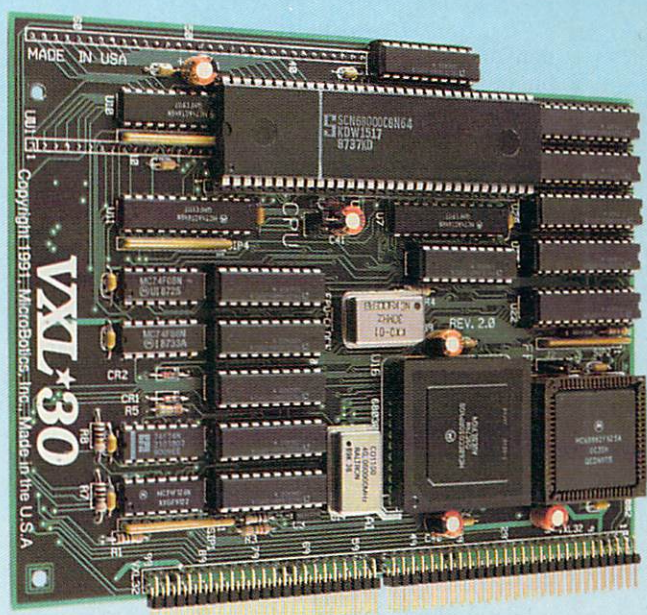
"MaxiPlan, the spreadsheet that launched a thousand lawsuits, should win by default. Despite its long history of bugs, if you are able to get the latest version, you will have the closest thing we've seen to a decent spreadsheet for the Amiga (which really isn't saying much). Let us all hope that the upcoming Professional Calc from Gold Disk will finally give us something re- ►

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sembling a truly professional spreadsheet product for the Amiga." —SL

"MaxiPlan gets the award for being marketed under more names and by more companies than any other piece of Amiga software in memory. The worksheet zoom and on-line help features are invaluable, although you must struggle occasionally with MaxiPlan's numerous bugs." —JJ

TELECOMMUNICATIONS

"The Amiga has plenty of choices in this area." —SL

JRComm (shareware)

"Call me cheap, but with the abundance of really good public-domain and shareware programs, I've always been able to find telecommunications programs that are better than those commercially available. I recommend either JRComm or Access. Both are extremely powerful, with many kinds of bells and whistles that are not generally available in commercial packages." —GL

"You can set virtually every one of JRComm's options and features individually by phone number in the phone book. That means that the program can completely reconfigure itself every time it dials a number. JRComm has just about the widest range of features, transfer protocols and terminal emulations available in telecommunications today, all dressed up in a friendly, productive interface. A joy to use!" —DJ

"I like JRComm's straightforward approach." —LL

"JRComm has the combination of features and functions that I want and use. It has all the power and configurability I need, and its look and feel are perfect for me. The one function JRComm lacks—the ability to execute scripts—is not something I need, even though I use my modem several times a day." —DS

2. Baud Bandit
Progressive Peripherals & Software
$49.95

"Baud Bandit is as easy and useful as a telecommunication package comes." —JJ

"Baud Bandit is cheap, flexible, and simple to use. If you need more professional features such as various terminal emulations, either A-Talk III (Oxxi) or Online! Platinum (Micro-Systems Software) are good choices." —SL

3. A-Talk
Oxxi
$99

"A-Talk III's powerful ARexx and internal scripting abilities, multiple terminal-emulation facilities, and extensive transfer protocols make it the best overall product and the one I increasingly turn to for my telecommunications needs." —LL

"The thing I like about A-Talk III is its wealth of terminal emulations and transfer protocols. I can spend more time telecommunicating, without having to worry about whether my software supports the things I need." —JJ

WORD PROCESSING

"The best graphics word processor is really just a hair removed from most desktop-publishing packages." —GL

GRAPHICS

ProWrite
New Horizons
$175

"ProWrite is the best word processor for the Amiga. It has great support for importing and printing graphics and a fast, fluid, and handsome interface. It allows you to insert all sorts of things (such as date, time, and custom characters) into the text, and it supports ARexx. The dictionary and thesaurus work like a charm, making ProWrite a fairly complete word processor that is appropriate for almost any task." —DJ

"Easy to use and powerful. ProWrite may not be the fastest program around, but it's faster than any other graphics word processor. It has all the features I want, including easy-to-use headers and footers, configurable tabs, and lots of keyboard equivalents. I like the way it handles large files and uses function keys to execute repetitive tasks quickly and easily. ProWrite is also extremely reliable." —DS

"Easily winning the award for the best-looking Amiga word processor, ProWrite is also possibly the best all-around text muncher on the market. The interface (excepting the bizarre file requesters) is flawless, and ProWrite is just about as solidly programmed as software can come." —JJ

"It can handle almost any kind of graphic. It is extremely quick, with great print capabilities and strong phone support from New Horizons." —GL

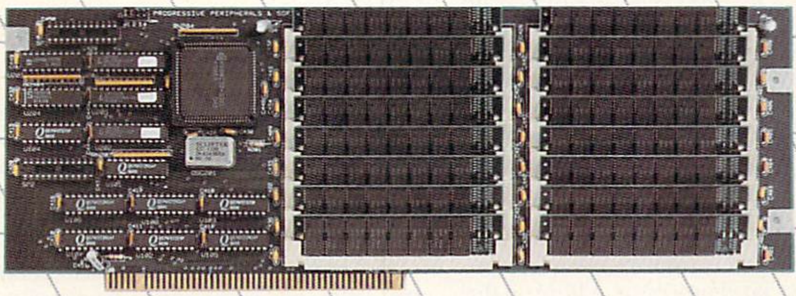
"ProWrite is solid and dependable, but lacks some basic features such as control of widows." —SL

"When I need to quickly create a short, attractive document with a fairly complex layout, I turn to ProWrite. I like its spelling checker and thesaurus, but my favorite feature is its unique way of handling bit-mapped fonts. By using a double-size font, scaling the output by half and selecting 80 dots-per-inch resolution on my 24-pin printer, I can generate near laser-quality output." —MK ►

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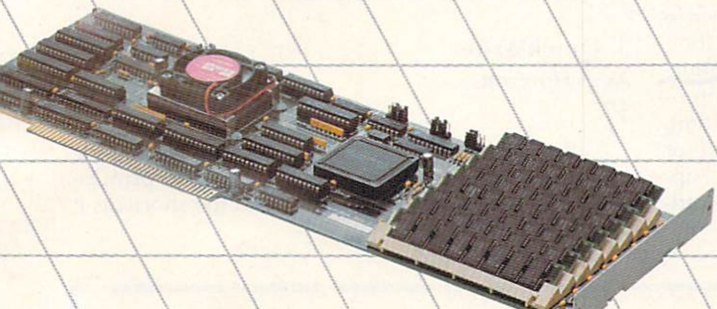
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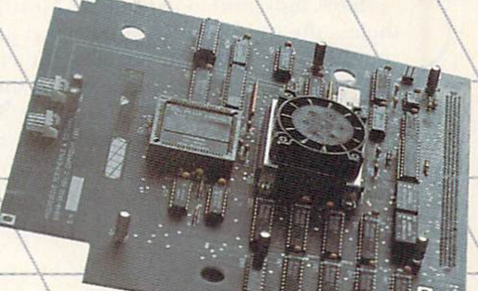
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2. Pen Pal
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"A superb combination of word-processing and database functions puts Pen Pal at the top of my graphics word-processor list. Pen Pal's word processor can easily create forms, and it offers a remarkable amount of control over imported graphics. With its flawless manual and on-line help, Pen Pal is truly an excellent choice." —JJ

3. excellence!
Micro-Systems Software
$199.95

"excellence!, with its graphic page preview and extensive grammar checker, seems to have more features than any other graphics word processor. A little on the slow side, it is nevertheless an excellent program." —JJ

TEXT ONLY

WordPerfect
WordPerfect Corporation
$249

"WordPerfect 4.1.12 provides the best bang for the buck. We can only hope the folks in Orem, Utah, will bring the latest version of the world's best-selling word processor to the Amiga (WordPerfect 5.1 for the Amiga has been rumored for a 1992 release). Amiga WordPerfect includes excellent spell-checking and thesaurus facilities, automatic footnotes and endnotes, an index and a table of contents, built-in outline generation, and extensive learn-mode macros." —LL

"Slow, ugly, and long of tooth, WordPerfect is nevertheless the most feature-laden word processor ever to run on the Amiga. With its powerful end-noting, footnoting, mail-merging, macro, math, and column functions, WordPerfect can handle just about any non-graphic writing task you can throw in its direction. Factor in the excellent documentation, robust printer support and WordPerfect's famed toll-free tech support, and you have a must-buy for serious Amiga wordsmiths." —JJ

"A vote with serious reservations. WordPerfect is not a particularly good Amiga program, but has power features (such as footnoting, indexing, and table-of-contents generation) unavailable anywhere else, making it a necessary evil for some writing tasks." —DJ

2. TransWrite
Gold Disk
$69.95

"Following closely on WordPerfect's heels is TransWrite, which incorporates many unique features such as Professional Page integration, nifty line-feed/carriage-return handling, and excellent WordPerfect import and export options." —LL

"Fast and lean, TransWrite is perfect for dashing off quick letters and editing large chunks of copy. A perfect companion to any of the popular Amiga publishing packages, TransWrite is useful for any Amiga-using publisher or editor." —JJ

"Most of what I write does not have to look pretty. TransWrite is fast and dependable; it lets me do what I want and does not get in my way. It lets me use a custom, interlaced screen with plenty of space for text, along with colors that do not flicker. Its spelling checker is fast and 99.99% accurate, and it has a complete set of formatting commands that let me create templates for every type of document I need." —MK

"What I need most in a word processor is speed. I like TransWrite because it runs fast on my pokey 68000 machine. I also like the keyboard shortcuts, and the fact that they are noted on the menus makes learning them a snap. A friend of mine berates TransWrite because its save feature is not foolproof; you can easily overwrite a document if you're not careful." —BG

3. QuickWrite
New Horizons
$75

"Although I am still not crazy about QuickWrite's file requester, I do like the program—especially its print facilities. I also appreciate its speed and the shortcuts it allows." —BG ■

EXTRAS

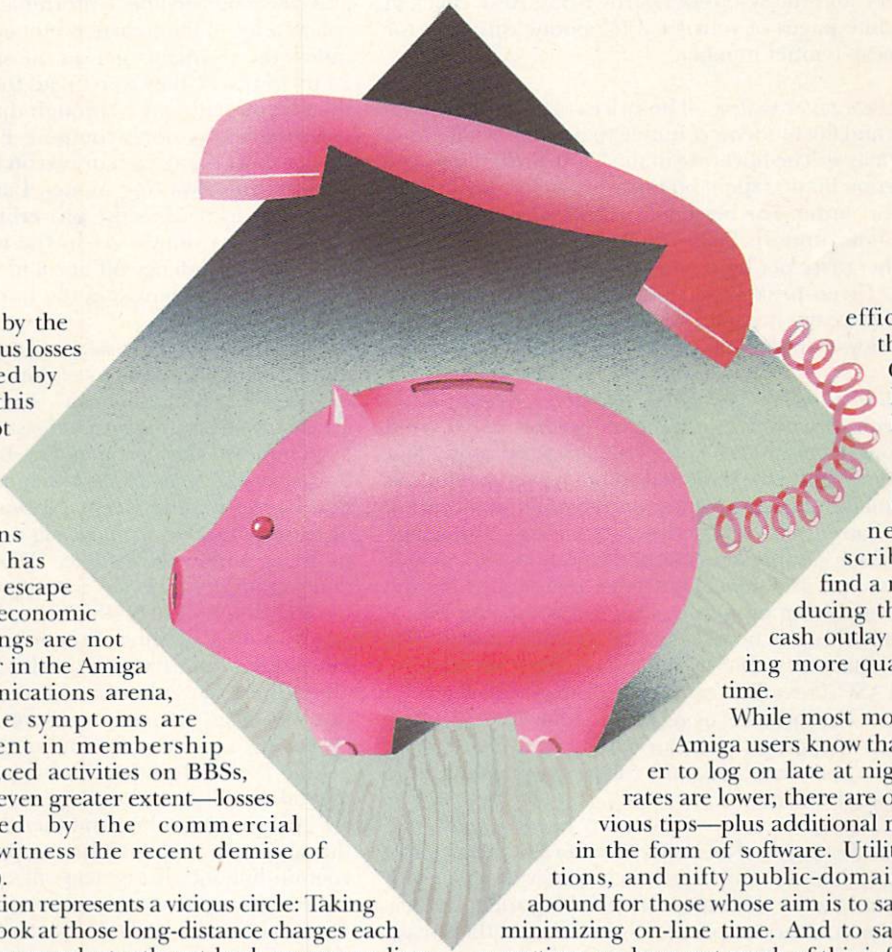
To fill some of your support roles, you will need extras—programs that do not fall into one of the defined categories. Often, products that defy strict categorization are the ones you rely on the most. Our experts recommend a number of such programs, some of which do not even fall strictly into the "productivity" field. Here's a list of the best extras for hire:

AmigaVision (Commodore)
ARexx (William Hawes)
Art Department Professional (ASDG)
Baby! (Micro-Systems Software)
CanDo (INOVAtronics)
Checkbook Accountant (public domain)
DeluxePaint IV (Electronic Arts)
Director 2 (Right Answers Group)
Directory Opus (INOVAtronics)
DiskMaster (Progressive Peripherals & Software)
Electric Thesaurus (SoftWood)
Gizmoz (Digital Creations)
Math-A-Mation (Progressive Peripherals & Software)
NAG Plus (Gramma Software)
SID (public domain)
Who! What! When! Where! (Blue Ribbon SoundWorks)
WordPerfect Library (WordPerfect Corp.)
Workbench Management System (TTR Development)

Dialing for Dollars

TELECOMMUNICATIONS TIPS

No matter what kind of telecommunicating you do with your Amiga, keeping down those long-distance charges is a major priority. Here are 10 tips for economizing on line—plus time- and money-saving recommendations for network front-ends and archiving utilities.



Judging by the enormous losses reported by AT&T for this past fall, not even the Goliath of the communications industry has managed to escape the current economic slump. Things are not much better in the Amiga telecommunications arena, either. The symptoms are most evident in membership drops, reduced activities on BBSs, and—to an even greater extent—losses experienced by the commercial networks (witness the recent demise of PeopleLink).

The situation represents a vicious circle: Taking a sobering look at those long-distance charges each month, we users reluctantly cut back on our on-line pursuits; as a result, the networks, which depend on our patronage, suffer. Everyone loses out.

The solution to all of this may lie in making more efficient use of the networks. Combining a little bit of knowledge with a dash of ingenuity, Amiga network subscribers could find a recipe for reducing their network cash outlay while enjoying more quality on-line time.

While most modem-touting Amiga users know that it is cheaper to log on late at night when the rates are lower, there are other, less obvious tips—plus additional money savers in the form of software. Utilities, applications, and nifty public-domain gimmicks abound for those whose aim is to save money by minimizing on-line time. And to save you even more time, we have put much of this information together here in one handy reference.

This article is divided into three parts. Part 1 presents tips and techniques for saving money on line; ►

By Tim Walsh

ILLUSTRATED BY JULIA GORTON

Part 2 examines two money-saving network front ends, CompuServe's Whap! and GEnie's Aladdin; Part 3 wraps things up with a close look at using file-compression—or archiving—utilities to cut down your uploading and downloading times.

1 TEN TELECOMM TIPS AND TECHNIQUES

#1. Always log on to a local number. As obvious as that advice sounds, a surprising number of network users dial long distance to get on line with their favorite nets. Often they are unaware that a local number may exist.

The easiest way to discover whether there are numbers in your area is to check with the network. Other sources include users' groups in your area, computer dealers, and the sysops of nearby BBSs. Also, check in the white pages of your local telephone directory for the local Tymnet number.

#2. Use a faster modem. The prices of 9600-baud modems and fax modems continue to decline. While those costs may still be hovering in the $450–$600 range, the reduction in time spent on line will pay for the modem in short order. Furthermore, nearly every major network now supports 9600-baud transfer rates, albeit at a higher price per hour and only in large metropolitan areas. Given price reductions in equipment over the past few years, no one should be transferring data at rates slower than 2400 baud.

#3. Always compress files before uploading. Compressing files with an archiving utility before uploading—covered in more detail in Part Three—makes good sense. Not only does this make files smaller, but it also enables you to combine the executables, documentation, libraries, and whatever else you desire into one easy-to-manage file. Which compression method you choose is a matter of personal preference, but most people opt for the newer archiving programs, such as LharcA and LZ.

While this practice is a real boon when transferring large binary files, such as games and applications, even small ASCII text files can benefit dramatically from the process. For instance, using the popular LZ data-compression program, you can compress a 5K text file down to less than 2.5K and cut your uploading time by more than half.

#4. Read messages off line, rather than on line. Many Amiga users do not realize how much money they can save by downloading messages, or capturing them in their telecommunications program's buffer, and then reading them when off line. Besides, unless you are a speed-reader, you are likely to have difficulty reading the text on line, as it tends to scroll rapidly off the screen.

#5. Don't debate mundane matters on line. Outside of prearranged conferences and forums, it is generally a waste of time and money to engage in lengthy debates and discussions on line. On the other hand, "flaming," as it is affectionately called, is a common means among network users of voicing their opinions and complaints. I heartily endorse and encourage the practice of posting "flames," for I think it is an invaluable way to provide rapid feedback to programmers, developers, and writers.

If you do feel obligated, however, to respond to egomaniacs and those who habitually bad-mouth products and publications, don't play into their hands with lengthy, belligerent responses to their comments. I find that a short, professional response works fine. Not only will you save money, but you will also earn the respect of other on-line conference members.

#6. Don't send electronic mail when a fax or letter might suffice. While magazine editors and computer personalities generate more E-mail than Pentagon employees did at the height of the Iran-Contra scandal, bear in mind that the nets typically pick up the tab. It is easy for network subscribers to get caught up in the convenience of E-mail and to upload letters, messages, birthday greetings, and so on to send to friends, relatives, and coworkers on line. Unfortunately, not only will you spend a lot of hard-earned money sending these, but unless the recipients get on the same network within 24 to 48 hours, they won't read the E-mail any sooner than if you had sent it through the postal service.

Furthermore, don't compose E-mail letters longer than a short paragraph or two on line, unless you particularly enjoy wasting money. I am not implying you should be as brief as the proverbial down-east Maine dairy farmer; simply get in the habit of first writing your correspondence off line and then uploading it to the desired recipient(s) in the E-mail area.

#7. Plan your on-line time in advance. While I usually encourage Amiga users to explore unusual areas on the nets (see "On-Line Bonanza", Aug. '91), my aim in this article is to discourage, or at least temper, your curiosity in hopes of saving you money. Beware of those money-devouring areas (unless they're "free"), no matter how interesting they seem. Networks know the power of teasers. Log on to most big nets, and you will see prompts stating things like, "Was that the real Elvis dancing in Memphis last Saturday night? Better go to the ELVIS IN MEMPHIS area and find out!" As enticing as another sighting of the King might seem to even casual Elvis fans, try to resist this kind of temptation. Often these are "plus-time" areas that charge admission as well as normal time charges, and you will wind up paying a premium to find out precious little.

Like any well-prepared shopper, make a written, mental, or macro-induced list beforehand of what you are going to do on line and then stick to it. Also, while the networks and telephone companies appreciate your on-line socializing, you will save money by joining a users' group if you simply want to chat with other Amiga computer buffs. If there are none in your area, show a little initiative and start one!

#8. Let the network know when you have problems. Don't pay for corrupted or aborted downloads. If you get a message for an aborted download, or if a downloaded file becomes scrambled during transmission, drop a short note on line to one of the sysops, or call one of the network's 800 voice numbers to let them know di-

rectly. You needn't pay for someone else's mistakes.

#9. Read your network bills carefully. Because most of the networks use state-of-the-art software for billing their customers, errors are rare. However, as with your credit-card accounts, your network account is fair game to telecommunications hackers and other electronic criminals. Check your bills carefully to spot any suspicious charges.

#10. Use a network front-end. This last tip takes us to the subject of Part 2. By way of introduction, though, take note of the fact that these programs represent proven ways to optimize your time so that you are always on line and off line in not only a minimal amount of time, but also with a minimal number of keystrokes.

2 FRONT-END OPERATIONS

As of this writing, there are only two networks that offer such front-ends—or "network interfaces"—but they happen to be the "Big Two": CompuServe and GEnie. Each one is designed specifically for use with its respective net. Bear in mind, though, that once you get one or both of these, you won't be packing your old telecommunications packages into the dark corners of your software closet. You will still want to use your terminal software for occasionally logging on to change settings and perform other functions not easily accessed with the front-ends. Let's begin with a look at the older of these two programs, CompuServe's Whap!. *(To contact the services mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 120.)*

WHAP!

Whap! is a commercial software package written by CIS sysops Steve Ahlstrom and Jim Nangano. The program is available to all CompuServe subscribers and can be retrieved from that network's AmigaVendor area (Go AmigaVendor), which has devoted an entire library to the program. Once you download it, you will be instructed to send a $30 user's fee to the developer, ATI of Littleton, Colorado. After the fee has been received, the next time you log on to CompuServe using Whap! your downloaded version will be fully functional.

Whap!'s automated navigation and data-retrieval system enables you to put into practice Tip #7 above: You can plan all of your on-line time in advance by selecting—off line—those areas or forums you want to visit, plus whatever files or text you want to scan, send, or retrieve once you get there.

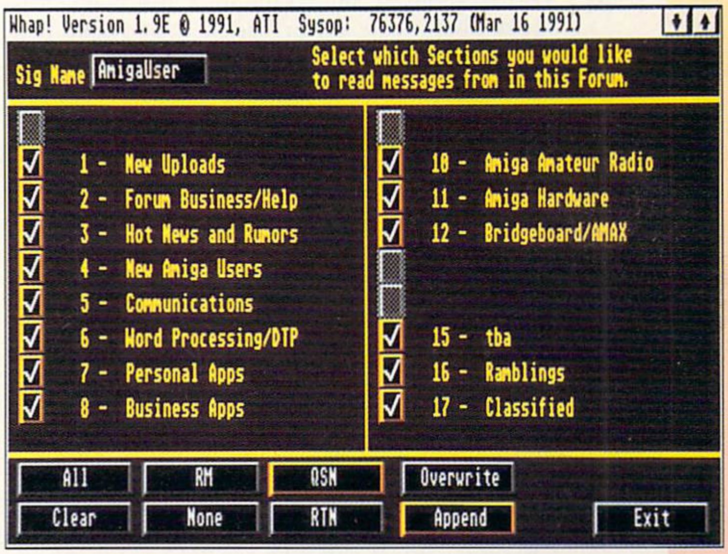
Getting underway with Whap! is fairly painless, and most users should find the hard-disk installation process a breeze. Using Whap! is equally easy. From its main menu, simply click on the various items that perform such actions as reading the newest messages from one forum, seeing the selected files from another, or sending E-mail. Because it all takes place before logging on, you can do this at your leisure. When the rates go down in the evening, let the program dial in and do all the dirty work quickly and efficiently.

After you log on with Whap!, it processes all the requests you have previously made. After it logs off, you can read messages and browse over the contents off line. You can answer messages and E-mail and mark files for downloading while off line as well. When you log on the next time using Whap!, it not only performs whatever new requests you specify, but it also uploads all your answers to messages and downloads all those files that you marked earlier while off line.

When library files are transferred, Whap! displays a pie graph showing the amount of the file remaining to complete the upload (or download). All file transfers are made using CompuServe's B+ protocol.

Built-in Whap! utilities also let you keep track of how much you are spending while on line. This information is displayed either in a bar chart or as text. Whap! also logs you in and automatically starts your terminal program at any time you choose.

Getting used to Whap!, however, can be a little difficult, because it does not use drop-down menus. Also, the blue default screen gives the program a somewhat dated look. Strictly as telecommunications software, not as a network front-end, Whap!—while it multitasks well—is not a low-overhead program in the same vein as, say, the latest versions of the freely distributable JRComm and BackTalk. Finally, Whap!'s documentation is sorely in need of a freshly sharpened editor's pencil to make accessing its infor-



You save money with Whap! by entering your messages off line.

mation easier when you need some additional, off-line help.

Still, despite such quibbles, Whap! is a proven money-saver. A noted CompuServe sysop, Steve Pietrowicz—who unashamedly admits that the most common complaint about CompuServe is the cost—tells me that Whap! saves him a great deal of time in performing daily chores. Many other people in the forums tell him that Whap! has cut their bills dramatically, too. After using Whap! for a while, I also applaud its efficiency—►

despite the documentation problem—and I recommend its use.

ALADDIN

The Amiga version of Aladdin was released in early September, 1991. Aladdin has been available for other computer platforms served by GEnie (IBM and Atari)



Alladin is your rapid-transit system for getting around in GEnie.

for quite some time. To get a copy, just type M 1055 at the top menu of any GEnie area and you will be whisked away to the Amiga Aladdin RoundTable. Also, be sure to get the ALAD_MANUAL.LZH documentation file while you are in that area.

Once you download Aladdin and its docs, you can begin using it right away—with no worries about having to pay additional fees. Aladdin sports a sophisticated, Workbench 2.0-like appearance, with monochrome gray screens that offer a plethora of 3-D raised buttons and drop-down menus.

Installing the program on your hard disk and setting it up is even easier than installing Whap!. You simply type your own log-on information and telephone number into the configuration area. The program saves that information and creates all the necessary files on your hard disk. If you select an area, such as reading new messages from the Amiga area, the program automatically dials the local GEnie number, logs you in, goes to the Amiga Bulletin Board, saves all new messages to disk, and logs you off. You can then peruse the new messages at your leisure.

Retrieving files is also a breeze. If you spot a particular file you want, Aladdin can easily retrieve i and download it to your disk. You can configure Aladdin to find files, shop on line, retrieve and answer your E-mail, or simply serve as a rapid-transit system to and from your favorite GEnie bulletin boards and libraries.

One of the things you will notice about GEnie after you log on with your old telecommunication package is that new menu settings are assigned to each area. If you have not committed all the necessary menus to memory, you will need to reset the command prompt when you log on again using your usual telecommunications program. Otherwise, you will have cryptic prompts to decipher and no idea of what to type.

GEnie has even dedicated some areas in the Amiga RoundTable to discussions of Aladdin that assist new users. After reading such statements there as, "I never really read the messages before... now I can read them at my leisure after Aladdin has captured them..." you probably will never again be embarrassed by your inability to decipher GEnie library commands.

3 C = M^2, OR, COMPRESSION EQUALS MONEY (LOTS) SAVED

As I mentioned above, compressing files before you transmit them will save you time and money. It is also generally expected as a courtesy to others who spend their money downloading your files.

If you have never used file-compression—or archiving—programs before, you should get a copy of Steve Pietrowicz's ARCHLP.EXE from library 16 in the Amiga-User area of CompuServe. After downloading, just double-click this file's icon, and it explains just about everything you need to know concerning common archivers. The file should give you the knowledge and confidence you need for creating your first archival file.

The most popular file-compression programs for the Amiga are Lharc, LharcA, LZ, Zoo, Pak, Warp, and Zip. While these can be found on most networks and public-domain catalog disks, I've listed only the GEnie file numbers for the sake of simplicity. Don't fret if you feel you lack the Amiga savvy to know which version is the fastest, smallest, most efficient, and so on. Monitoring the status of archiving programs is futile, since updates and revisions occur on almost a weekly basis.

It's more important that novice telecommunication users learn to identify at a glance the compression methods used on files. Lharc and LharcA programs are readily identified by the .LZH suffix at the end of the compressed files, while LZ-compressed programs have .LHA file extensions. Zoo, Pak, Warp, and Zip have .ZOO, .PAK, .WRP, and .ZIP extensions, respectively.

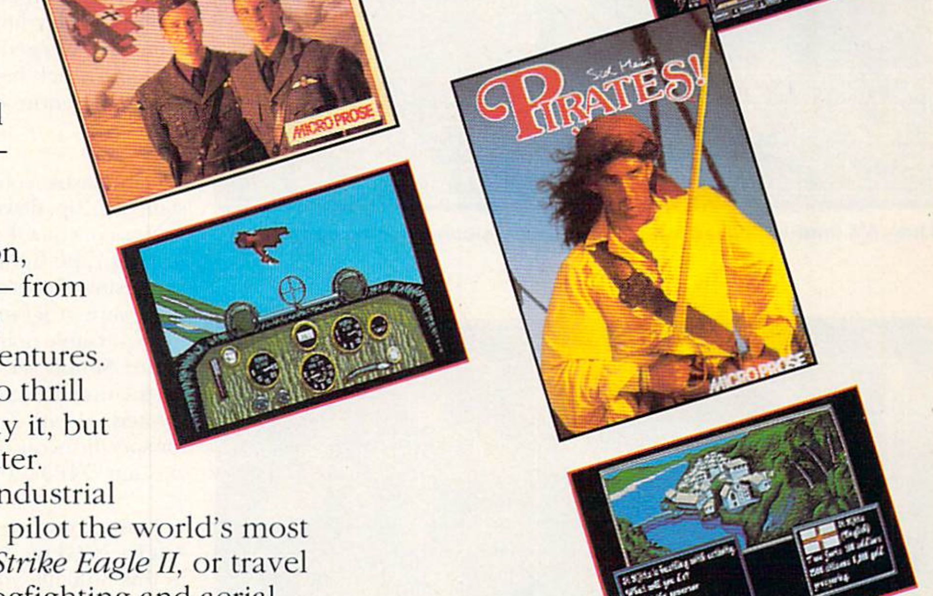
An older method, Arc (which uses the .ARC extension), still enjoys some popularity, but slow speed and inefficient compression have caused it to fall out of favor over the years. Its faster, more efficient successor, Lharc, is our first file-compression candidate.

LHARC AND LHARCA

Lharc (latest version 1.30 and available as file #9591 in Library 4 of the Amiga area of GEnie) enjoys wide popularity in the Amiga community, as it has established a solid reputation over the two years since it was introduced. Used from the CLI or Shell, Lharc employs straightforward syntax: LHARC (?) filename, where (?) is the letter representing the function to be performed, such as appending files to an existing file, listing files, extracting files, and so on. Commonly used in conjunction with commercial disk utilities, such as Progressive Peripherals' DiskMaster and countless freely distributable utilities, Lharc readily lends itself to point-and-click operations.►

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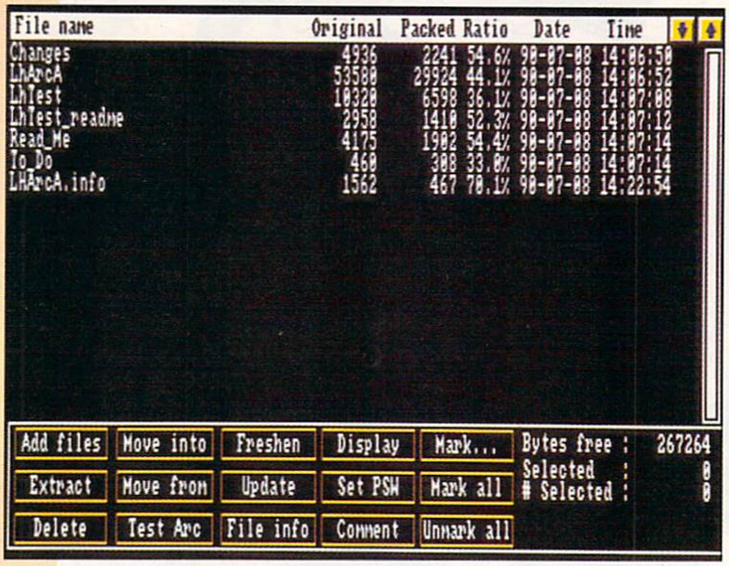
Circle 66 on Reader Service card.

An updated version of Lharc, LharcA uses an Intuition-based interface and boasts improved algorithms for added speed and tighter compression. The latest version of LharcA, 99D, is available as file #8714 in Library 4 of the Amiga area on GEnie.

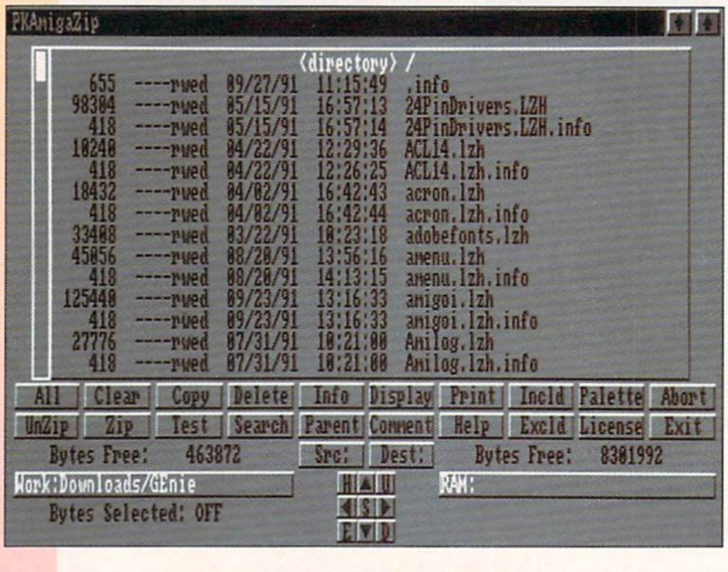
LZ

A possible successor to the Lharc programs, and one of the more useful utilities you could have in your telecommunications library, is LZ, written by Jonathan Forbes. Backwardly compatible with files compressed using Lharc and LharcA, the latest version of LZ at this writing (1.92) can be found on most networks and is available as file #12152 on GEnie. It is a product of Xenomiga Technology, based in Toronto, Ontario, which asks for a contribution of $15 from all users of the program.

LZ is the fastest LZH archiver and extractor available for the Amiga. It is also currently the only utility available for the Amiga that can archive or extract in the new, more efficient LHA archive format.



LharcA's Intuition-based interface makes file-compression easy.



PkaZip's fast and versatile point-and-click system is a joy.

Zoo

The fastest Amiga file compressor can be found in the Amiga area of GEnie as file #11912: ZOO21.PAK, the latest version (2.1) of the Zoo archiving program. Zoo achieves file-space savings in the range of 20% to 80%, depending on the type of file data being compressed.

As with Lharc, you can use Zoo either from the CLI or Shell. While it is extremely fast, it lacks some of the more subtle features of the latest archiving utilities. Although seldom used on the networks, Zoo-compressed files do show up occasionally, so it is a good idea for all Amiga network users to have a copy.

Pak

Another pioneering file-compression program that still sees some network use is Pak, a shareware program by Mark Riley that creates self-dissolving archives. If you long for nostalgia, you can obtain this file by downloading PAK.PAK from Library 4, file #3225 on GEnie.

Warp

File #8465 in the same location is also home to version 1.40 of LhWarp, the most up-to-date version of the Warp whole-disk archiver. Earlier versions of the Warp utility abound, but this is the only one that you need.

While its use is generally limited to compressing and copying entire disks, LhWarp is another utility that Amiga telecommunications users should have somewhere in their libraries. Not only is it a necessity for handling Warped files, but it can also make a compressed, track-by-track copy of any device, since it copies the entire disk structure.

ZIP

To familiarize yourself with our final file-compression standard, Zip, download PKAZIP_1.01, file #7870 in the Amiga area on GEnie. PkaZip is an integrated archiving program and Intuition interface rolled into one. A slick, professional control panel characterizes this excellent shareware program. PkaZip offers one of the faster and more versatile point-and-click systems you will find anywhere. Simply select the respective paths on source and destination drives and choose the process you want performed. As with Zoo, PkaZip is another must-have item for specific occasions, namely, when you need it to "unzip" any .ZIP files you download.

A new compression scheme on the network scene is AugJpeg (GEnie Amiga library 13, File #12691). Within this 80K file you'll find two 24-bit conversion programs, DJPEG (Decompress JPEG) and CJPEG (Compress JPEG), with specially designed 68030 versions included. These programs let Amiga network users compress and decompress JPEG files to and from PPM- or PGM-format image files. You'll be able to spot image files compressed with this new technique by their .JPG file extensions.

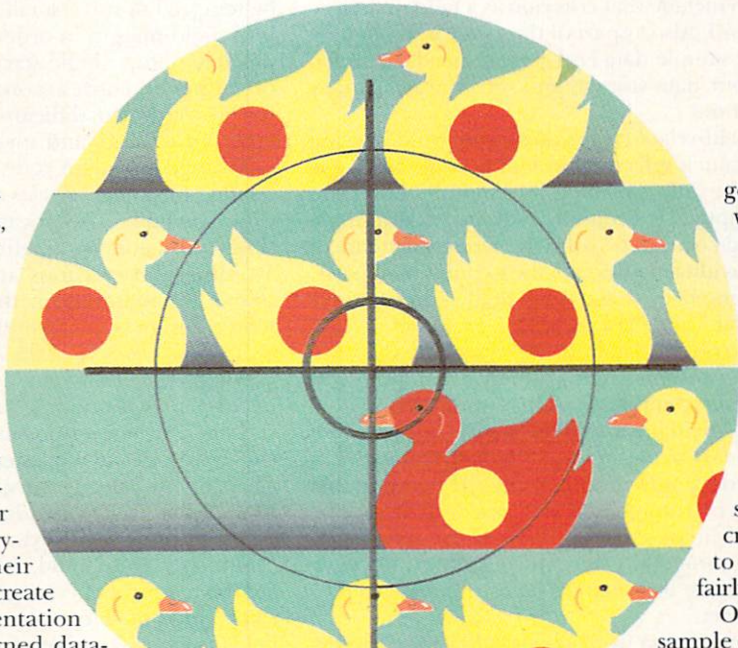
Armed with an arsenal of telecommunications tips, network front-ends, and archiving utilities, you should now be ready to assault the networks again without piling up massive bills for time and charges. ■

PRODUCTIVITY TIPS
2

Getting Your Ducks in a Row

DATABASE DESIGN TECHNIQUES

Whatever your application, creating a useful database designed around your specific needs may make the difference between scoring a bull's-eye and shooting yourself in the foot.



What do payroll records, mailing lists, and modern multimedia applications have in common? Many Amiga users—especially those who are more graphically oriented—may be surprised to discover that no matter whether they are trying to organize their business data or to create an elaborate presentation script, a well-designed database is often crucial to the success of the project.

PLANNING MAKES PERFECT

The key to effective database design is taking the time to think about the nature of your data and how your application will utilize it—before you actually begin setting up your system. Ignoring this essential process results all too often in hours of rekeying information or disappointment with the final product.

The first step is to examine your data in order to devise an organizational structure. If the data you are going to be working with has not yet been created, make up some data that is closely similar to the kind of information that you *will* be dealing with. Write this data out on a piece of paper or look at it in a word processor. Be sure that you create sufficient data to make your sample fairly representative.

Once you have your sample data, you must identify the relationships between its subelements. Just as all matter in the universe is made up of the same fundamental components, namely, atoms and molecules, all databases share a similar underlying structure. The basic building blocks that make up all databases are called records and fields. A record is a group of related bits of information—fields—that describe one individual item, person, or event. In a typical mailing-list database, for instance, each record consists of information describing where a particular person lives. The fields in such a record would thus ►

By Loren Lovhaug

include the name of the individual, his or her street address, the city and state, and the zip code.

While selecting the fields to include in each record may appear to be as simple as identifying the types of information repeated from record to record, be careful not to oversimplify the process. A common mistake is to limit unnecessarily the number of fields you have for each record in the belief that compact records mean faster, more efficient database use.

While it is true that the amount of storage your database requires and the length of time it takes to access each record does increase with the number of fields per record, these factors are nearly always offset by problems and limitations arising from overly terse records. Leaving out certain fields ultimately hampers your ability to search and access records intelligently.

With this in mind, try to imagine the kinds of criteria you want to use as the basis for searching and sorting records. Likewise, try to envision the kinds of information that will make up the reports your database is to output (either on screen or on paper). A good rule of thumb is that if there is even a remote possibility of doing a search or a sort based upon any one particular criterion—or of incorporating such information in a report—then include that criterion as a field in designing your record. Also as part of this process, try to look beyond your sample data and current needs to anticipate what your data storage and retrieval needs may be in the future.

Another field-related trap you should avoid is trying to cram too much information into a single field. For instance, in the simple mailing-list example above, you might be tempted for economy's sake to make a single "name" field—such as "John K. Doe"—instead of breaking individual names into their component parts, each represented by a separate field: "first name," "middle initial," and "last name."

The basic rule in database management is to use fields that represent singular, logical components. Think about the complications that would arise with a single "name" field if you wished to sort your database according to last name followed by first name. Separating field data into singular, logical components makes it easier to search and sort based upon specific criteria. In addition, creating fields in this way makes it easier for someone else entering data into your database to locate information he or she may need to revise or correct.

One final cautionary word about field and record organization: Know your field types. Most database packages (or modules in the case of multimedia programs) generally include support for at least four field types: (1) *text* (for storing textual information such as names, cities, and descriptions); (2) *numeric* (for storing number data such as counts, totals, or currency); (3) *temporal* (for storing time or date information); and (4) *logical* (for storing binary choices such as "yes/no" answers).

More advanced database-management systems such as Precision's Superbase include additional field types for calculations, validated data entry, external files, and other sophisticated operations. It is important, therefore, that you assign your fields the proper field type; otherwise, you may be limited in what you can do with your data. Take the time to read the field-type descriptions in the manual and to study any examples it may provide.

Make It Easy, Make It Fast, Make It Accurate!

While a well-conceived organizational structure enhances the speed and efficiency of database operations, there is more to effective database design than field and record organization. Studies indicate that time spent on developing clean, simple, logically organized user interfaces pays off dramatically in increased productivity for database work. The Amiga's wonderfully flexible tools for customizing user interfaces provide a real incentive for paying careful attention to this very important factor.

Drab, poorly conceived data-entry screens lead to keying errors, fatigue, and low productivity. When designing such screens, try to provide extensive visual cues to assist the data-entry process. Using colors, borders, shadows, prompts, images, and comment lines can contribute to this goal.

In your quest to make screens visually appealing, however, be careful not to overload them. As with desktop publishing, the effective use of "white space" and typefaces can add visual consistency and clarity. Don't be tempted to use a small screen font and little if any intra-field margin in order to place as many fields as possible onto a single screen. Despite the advantages of getting an entire record's worth of fields onto one screen, a crowded, difficult-to-read screen cuts down on both the accuracy and speed of data entry.

Arrange and align your fields logically, so that data relating to similar aspects of a particular record are in close proximity and appear "in-line." Finally, avert possible confusion by labeling your fields clearly and avoiding abbreviations and obscure codes. A good source for material on the aesthetics of data-entry screen design is the recently published *Amiga User Interface Style Guide* ($21.95, **Addison-Wesley**).

When designing your user interface, also consider making provisions for automated entry and error checking. Whenever possible, use look-up or multiple-choice dialogs and requesters in place of manual typing. This not only speeds entry, but also increases accuracy. In addition, try to provide for data entry via both the mouse and the keyboard.

Similarly, you should always provide, if possible, for automated error checking. You often know in advance what kinds of data should be entered into specific fields, such as a range of values for a numeric field; therefore, it makes sense to provide mechanisms for automatically detecting when the user enters information that falls outside of the parameters you have specified. Programs such as Superbase and Commodore's AmigaVision make it easy to set up automated error-checking routines (generally something as simple as filling a range of acceptable values).

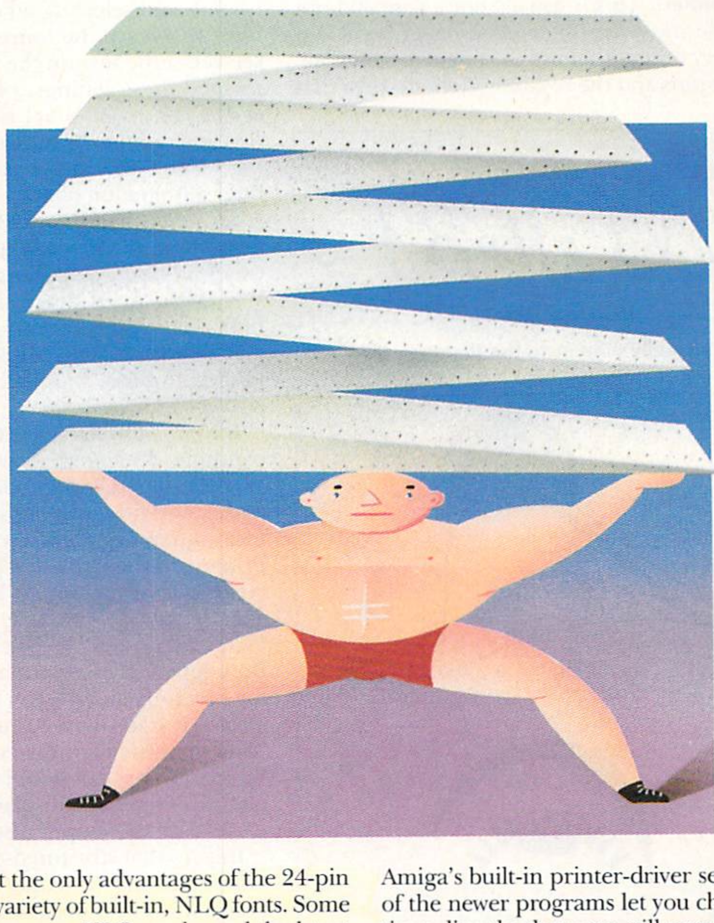
In closing, be sure to budget ample time for design and testing work for any database project. There is no substitute for good planning, and the practical results of your work will prove that it was time well spent. ■

Loren Lovhaug has taught and written about computers since 1984 and has been a sysop for several commercial BBSs. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

Pump Up Your Output!

DOT-MATRIX PRINTER TIPS

You don't necessarily need a fancy—and expensive—laser printer to satisfy most printing requirements. Check out these tips on maximizing your dot-matrix output and obtaining high-quality printed results with a variety of popular Amiga software.



Although laser printers have dropped below the $1000 price barrier, many of us are still using low-cost dot-matrix devices to save pennies. So that they can maintain their competitive edge, dot-matrix printers now offer more features for fewer dollars than ever before. Even the very latest models of the lowly nine-pin printers now sport built-in, NLQ (near-letter-quality) modes. It is, however, the 24-pin printer that offers the most bang for the buck.

Higher resolution (as much as 360 dots per inch) and greater speed are not the only advantages of the 24-pin printer. Most have a variety of built-in, NLQ fonts. Some also offer a multipass, super-NLQ mode, and the latest provide built-in scalable fonts. When you consider that many of these units have a street price of around $250, you are looking at some real bargains.

Although you can easily pick a built-in font by using the printer's panel controls, changing the font or the graphic print resolution is not always possible with your applications software. The problem is that the Amiga's printer drivers do not provide access to the control codes that manage the advanced refinements available with the current crop of dot-matrix printers. Certain programs, however, go above and beyond the call of printer duty to let you get more out of your hard copy. Here are some of the things you should look for.

SETTING THE SETTINGS

Do not neglect the Amiga's built-in printer-driver settings. Although most of the newer programs let you change Preferences' settings directly, there are still many older programs that rely on the settings you make from the Workbench, careful selection of which can make a marked difference in the quality of your hard copy. Refer to Commodore's documentation to determine the density settings ►

By Morton A. Kevelson

ILLUSTRATED BY JULIA GORTON

available for your printer. Although seven settings are supported, most dot-matrix printers are able to take advantage of only three or four. For example, the EpsonQ driver, used with a wide selection of Epson-compatible 24-pin printers, supports only densities 1 through 4.

I have found that density number 3, which gives you a 180×180-dpi (dots-per-inch) resolution, is the best choice to use with the EpsonQ printer driver. The resulting square printer pixels help ensure undistorted output with many programs. If you are trying to match the square pixel in your bitmapped painting program, the Amiga's 640×400-pixel, high-resolution interlaced display screen comes the closest. If your monitor has accessible width and height controls, you may even be able to adjust it for a square display pixel.

It may be worth your while to try out density number 4 with your printer. With this setting, the EpsonQ printer driver doubles the horizontal resolution to 360 dpi. If you like the results and can spare the time, then by all means indulge yourself. You are more likely, however, to be disappointed. This is usually not a true 360-dpi mode, because most Epson-compatible printers can print only every other dot in this setting. Furthermore, the size of the pins and the resulting dots are such that even if you were to print adjacent dots, they'd overlap.

Good to the Last Dot

Moving from printer-oriented tips to those involving specific applications software, there are several Amiga programs that can help you wring the very last dot out of your dot-matrix printer. *(For information about contacting the developers of products mentioned below, see the "Manufacturers'/Distributors' Addresses" list on p. 120.)*

ProWrite 3.1 ($175, ***New Horizons***) is a full-featured, WYSIWYG (what-you-see-is-what-you-get) word processor that has earned a reputation for excellent text handling as well as for its built-in graphics support, multiple column output, spelling checker, and thesaurus. What is less well known is that you can use ProWrite 3.1 to coax very high-quality text out of your printer by employing the Amiga's very own bitmapped screen fonts.

Those of you who have tried to print screen fonts with other programs may well have been disappointed by the jagged results. With ProWrite, you can get around the jaggies by choosing a high printer resolution, turning off the aspect adjustment, shrinking the output, and selecting an oversized, bitmapped screen font. Just leave the font selection for last, as you will see very little text on the screen after you have implemented these settings. I have found that screen fonts in the 24- to 30-pixel range give good results with density number 3 and the EpsonQ printer driver. (ProWrite 3.2, which was released at press time, may offer automation of some of these processes.)

Although **KindWords 2.0** ($99.95, ***The Disc Co.***) is not as graphically adept as ProWrite, it offers excellent text handling, a spelling checker, a thesaurus, and WYSIWYG word processing. KindWords generates a high quality of text output with its proprietary downloadable SuperFonts. Although the selection of fonts is limited to those supplied with the program, they are adequate for basic text.

In spite of ***WordPerfect Corporation***'s decision not to continue development work on the Amiga version, **WordPerfect 4.1** ($250) has a solid reputation as one of the most powerful word processors around. It comes with custom printer drivers for nearly every dot-matrix printer on the market. These drivers let WordPerfect access all of the printer's built-in fonts and font styles.

A Matter of Graphics

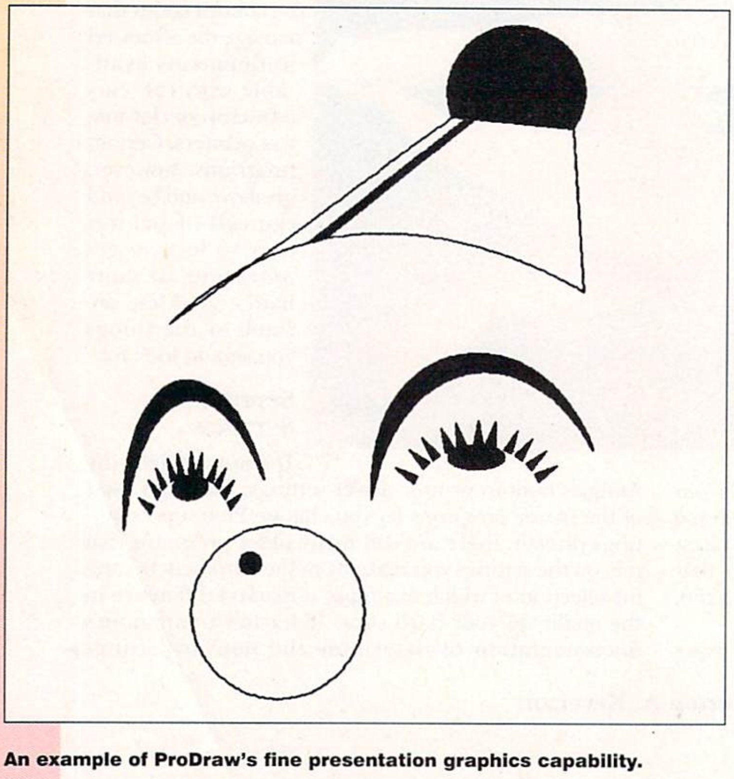
Bitmapped drawing or paint programs are well suited for creating images you want to view on the video screen. If your ultimate goal is hard copy, however, the paint program may leave something to be desired. The shortcoming is not in the program, but in the low resolution of the video display—less than 80 dpi—as compared with the output resolution of the printer.

Images that structured-drawing programs create are independent of the output device's resolution. Such programs work with images that are represented by their mathematical descriptions. For example, a line consists of the coordinates of its end points and the thickness of the line. By comparison, a paint program stores the actual screen dots that represent the image of the line.

The advantage of a structured-drawing program is that you can scale the images it creates without any loss of resolution. In the same way, you can show the images on any output device without any distortion, while taking advantage of its maximum resolution. ►



ProWrite makes it possible to virtually eliminate the jaggies.



An example of ProDraw's fine presentation graphics capability.

7 Steps to Excellence

PageLiner

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ART EXPRESSION

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A wide range of structured-drawing programs is available for the Amiga. At one end of the scale, you find CAD-type programs that are suitable for engineering drawings. At the other end are the drawing programs—such as **Professional Draw 2.0** ($199.95, ***Gold Disk***) and **ProVector 2.0** ($299.95, ***Stylus***)—that are designed for presentation graphics. For our purposes, both Professional Draw and ProVector fully support the Preferences printer drivers. This means that the drawings you create with these programs can be output at the maximum resolution of your dot-matrix printer.

Text is also treated as a structured object by these packages. Both programs have enough fonts to get you started, and Stylus will send you an additional font disk at no charge when you return ProVector's warranty card. The disk also contains a utility program that lets you convert PageStream format outline fonts to ProVector format. **MIoutline** ($125, ***Mirror Image Productions***) is a similar utility that converts Type I PostScript fonts to Professional Draw format.

If you are a ProWrite user, you should consider **DesignWorks** ($99), ***New Horizons***' entry in the structured-drawing arena. This is an entry-level program with a user interface that closely resembles that of ProWrite. Text in DesignWorks is based on the Amiga's bitmapped screen fonts. If you have updated your system to AmigaDOS 2.0, you can use DesignWorks to access the bitmapped screen fonts generated by Agfa's Intellifont scalable-outline font technology, which 2.0 incorporates.

DESKTOP PUBLISHING

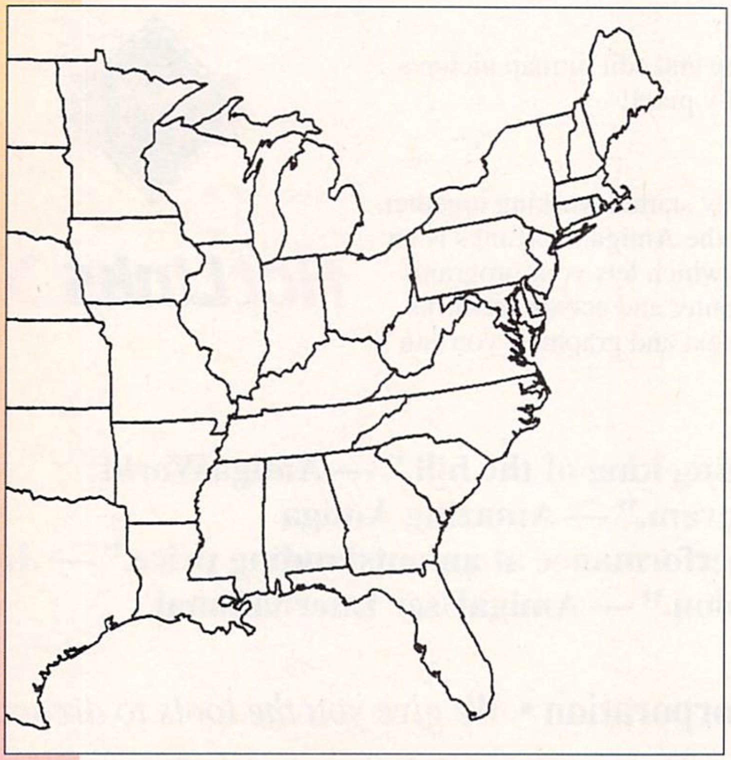
Although you may not ordinarily think of your dot-matrix printer as a suitable tool for desktop publishing, you will be pleasantly surprised by the quality of the hard copy that you can get with it. Both **Professional Page 2.0** ($395, ***Gold Disk***) and **PageStream** ($299.95, ***Soft-Logik***), a pair of heavyweight Amiga page-layout programs, fully support Preferences' printer drivers. This means you can print documents created with either program on your 24-pin printer at its maximum resolution.

PostScript is a programming language—or, more specifically, a page-description language—that instructs an output device how to render and position text and graphics on a printed page. It is an option that you would normally associate with a high-end laser printer and not with your own dot-matrix machine, although the way things are going, PostScript may be added to 24-pin dot-matrix-printers before very long.

With PostScript, however, you need neither wait nor invest in a laser printer. Software-based PostScript interpreters already available for the Amiga can turn a PostScript document into high-resolution hard copy on your dot-matrix printer. All you need is a little patience, as these programs are not nearly as fast as a PostScript-equipped laser printer.

PixelScript from ***Pixelations*** ($149) is just such a commercial PostScript interpreter for the Amiga. The program is supplied with its own versions of the Times and Helvetica fonts. Although it is easy to set up, some knowledge of PostScript is helpful when using it.

Another one is Post, a freely distributable PostScript interpreter by Adrian Aylward, of Wiltshire, England. Setting up Post is a bit of an exercise. If you do not already use the freely distributable ConMan program, you will have to locate a copy and mount it on your system. You will also want to locate and install some Adobe Type I fonts for use with Post. The FunkyFont sample font that is included with the program is rather limited. On the plus side, Post offers screen as well as printer output, and it supports color.



With ProVector, you can clearly define the outlines of the states.

TYPESETTING, ANYONE?

AmigaTEX (***Radical Eye / Micro Programs***), a typesetting language and system for use with books and manuscripts, is particularly well suited for documents dealing with mathematics. The basic AmigaTEX package sells for $200 and includes—on 14 disks—the main program, a screen previewer, a bibliography database program, and over 1500 previewer fonts. To use it, you also need one of the $100 printer-driver sets.

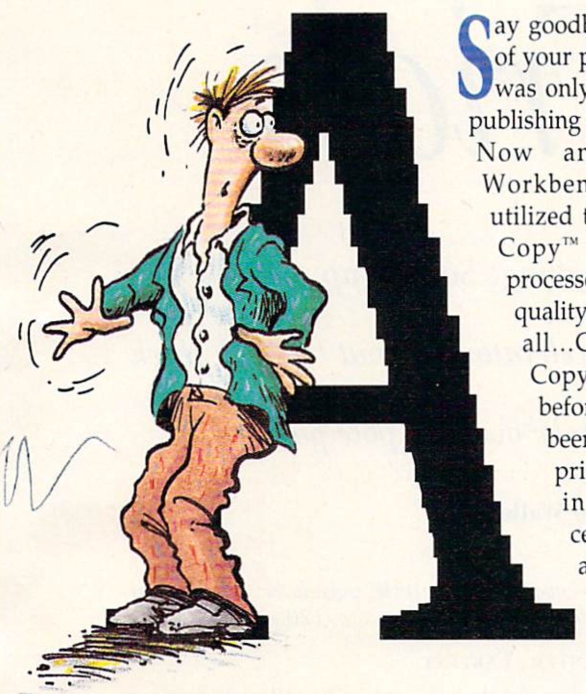
The Epson FX Driver set comes on ten disks and includes a driver and fonts for the Epson FX, MX, JX and compatible printers. The NEC P6 Driver is a six-disk set for the NEC P6/P7 series printers as well as for the Epson LQ series of 24-pin devices. An eight-disk laser-printer and PostScript-driver set is also available. AmigaTEX is supplied with a 380-page manual, and, of course, generates hard copy at the maximum resolution of your dot-matrix printer.

The tips and product pointers presented here are only some of the many ways in which you can increase your range of tasks with dot-matrix printers and maximize the efficiency of your output. As you can see, there is a lot of use left in these old workhorses—so don't relegate them to the back of the closet just yet. ■

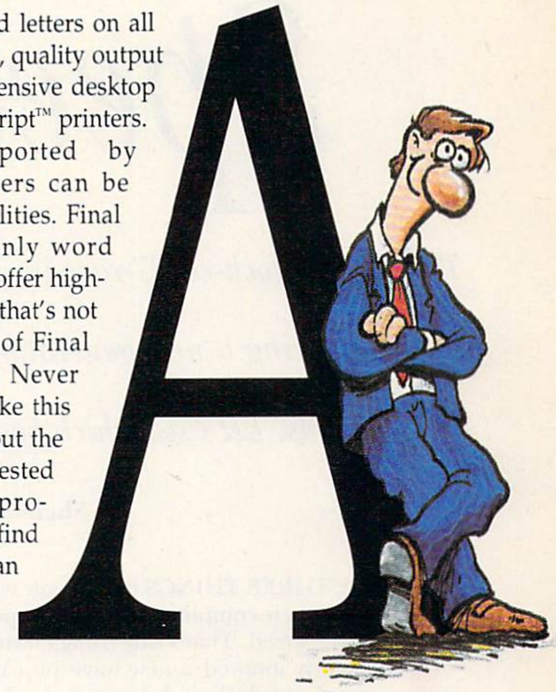
Morton Kevelson holds a day job as an electrical engineer. He has vast computer experience and writes regularly for a number of Amiga publications. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

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Formula '40 Speed Trials

This is no "stock-card" race in a country-fair setting. Souped-up A2000s and 3000s packing a new generation of 68040 accelerators are out to break track records. Let's see which board is ready to take over the pole position.

By Sheldon Leemon and Lou Wallace*

THE THREE THINGS that people want most from their computers are speed, speed, and more speed. That's why Amiga owners have eagerly awaited a new wave of accelerator products designed around the Motorola 68040 chip, a processor that promises to provide an entire new level of performance.

Perhaps that is also why there has been unprecedented interest among hardware manufacturers in producing '040 accelerators. Although the chip has been available for only a short time, there are already three 68040 boards for the Amiga 2000—the **Fusion Forty** ($2399, ***RCS***), the **Progressive 040/2000** ($2260–4260, depending on memory, ***Progressive Peripherals & Software***), and the **40/4 Magnum** ($3999, ***CSA***).

Progressive also makes a 68040 for the A3000—the **040/3000** ($1795)—and more boards for both Amiga systems are expected shortly from ***GVP*** and ***Supra*** (see the sidebar "Almost Ready to Fly" for descriptions of 68040 boards that were not ready in time for this review). *(For information on contacting the developers of all the boards covered in this article, consult the "Manufacturers'/Distributors' Addresses" list on p. 120.)*

Fast, Faster, Fastest

Just how fast are these boards? Overall, they perform at two to three times the speed of the 68030 accelerators, which are two to three times faster than the 68020 accelerators, which, in turn, run two to three times as fast as the 68000 processor used in a stock Amiga 2000 or A500. Multiply those speed increases together and you get a performance boost of anywhere from 15 to 25 times that of a 68000-powered machine.

Motorola incorporated a lot of advanced technology into the 68040 to achieve this level of performance. They reduced the number of cycles needed to execute most of the instructions and increased the size of both the data and instruction caches to 4K each. This means that the information the chip needs to process is generally already stored in its internal memory, eliminating the slow step of fetching this information from system memory. ►

* The main article and descriptions and test results for the A2000 boards were written by frequent *AmigaWorld* contributor Sheldon Leemon, while *AW*'s Lou Wallace provided the coverage of the A3000 accelerators.



STP
040
AW
Edelbrock
040
040

The data cache can now operate in copyback mode, in which changes that are made to internal data are not copied to memory until the contents of the cache are replaced by new data, or until the cache is explicitly flushed (copied to system memory) by the program. This helps eliminate unnecessary write and read operations. Finally, the 68040 has a lot more built-in concurrence, which means that, like the Amiga itself, it can perform more than one operation at a time.

Even if you don't appreciate the technology, the results are bound to impress you. Using any of these accelerator boards is like strapping a rocket to your Amiga. DeluxePaint (Electronic Arts) renders animations a frame, instead of a scan line, at a time. When AD Pro (ASDG) scales a 24-bit image, the progress needle moves like the second hand on a clock, instead of advancing one slow degree at a time. File-compression programs like LHArc seem to move at normal speed, instead of in slow motion. In short, operations that are annoyingly slow even on an Amiga 3000 now proceed at a reasonable pace, and everything else just flies.

But Will They Work?

The technology improvements that dramatically increase the performance of the '040 chip, however, also increase the chances for incompatibility with current software. For starters, the 68040 includes all of the design features that caused software to fail on the 68020 and 68030 chips. Programs that do not work on an A3000 are sure to bomb out on any of these accelerators. Moreover, since the caches are so much larger on the '040, practices that were questionable on '030 machines are now downright fatal.

The single biggest new cause of incompatibility, however, may be the copyback mode on the data cache. When copyback is turned on, the data the processor sees at a particular memory location is often completely different from that which is actually stored in system memory. Even the Amiga operating-system software is vulnerable to discrepancies arising from this situation. When you're running under Kickstart 1.3, simply loading a program with copyback turned on will cause a fatal crash. That's because the system first loads the program as data and inserts actual memory locations into the code.

Unfortunately, unless the cache is flushed, these updates don't make it into memory, and the processor executes the uncorrected program code that resides in memory—with disastrous results. I did find, however, that the Turbo Imploder compression program is 68040-smart; programs loaded by its explode.library will work correctly with copyback on, even under 1.3.

A fair number of patches must be applied to the system software just to get 68040 accelerator boards running under 1.3. Even so, you must remember to turn off the copyback mode whenever loading or exiting a program, a real headache that inevitably leads to frequent crashes. Of course, you can always run with copyback off, but then you lose about 10–20% of your speed. Commodore's official position is that the 68040 processor is not supported under system 1.3.

The situation improves dramatically when you use Kickstart 2.0 ROMs (but not when loading 2.0 from disk). The new operating system is 68040-aware, and it includes new function calls that can be used to flush the data cache at the appropriate times. Programs can be opened and closed with the copyback mode turned on, unless they have been compressed with a program that is not aware of cache problems. Commodore even offers a 68040 compatibility library that developers can license to help smooth the way.

Even with all of this help, a number of programs remain 68040-incompatible, particularly with copyback turned on. For example, the current version of A-Max II (ReadySoft) does not work at all with '040 boards. The ARP commands are prone to failure, and some programs such as AMOS (Mandarin) and Imagine 1.1 (Impulse) will crash if loaded with copyback turned on. (They do function perfectly, however, if copyback is turned on *after* they start up.) Although almost all the current applications software I tried worked without a hitch, numerous incompatibilities among shareware and older commercial programs are bound to turn up until programmers are alerted to all of the pitfalls.

At the time of this writing, Kickstart 2.0 ROMs are still not available to the general public. In addition, some software is still not fully 2.0-compatible. (Version 1 of NewTek's Video Toaster software, for example, exhibits a few quirks when running under 2.0.) Hopefully, by the time you read this, version 2.0 of both Kickstart and the Toaster software will be readily available, alleviating many users' most serious concerns.

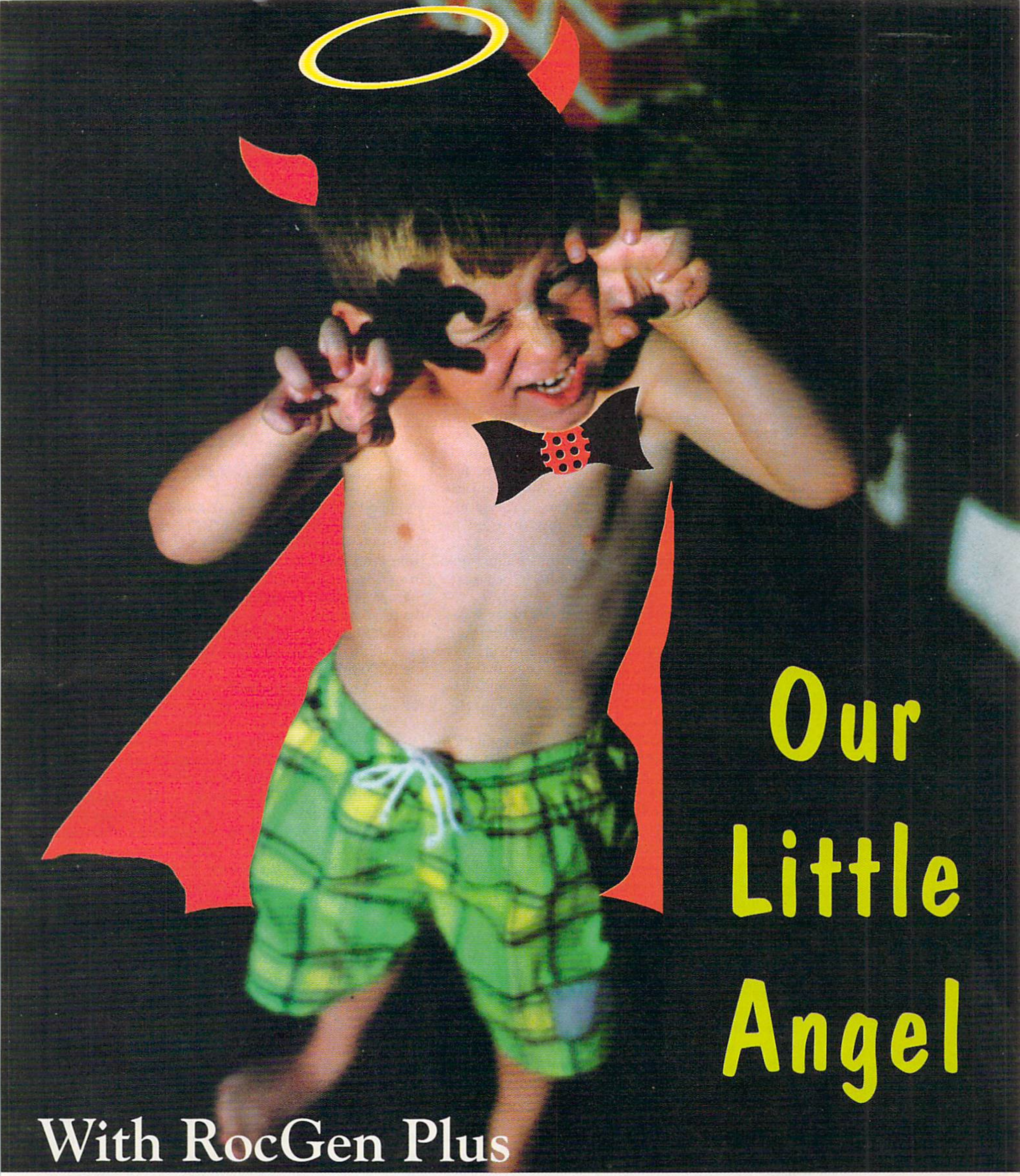
It's a Hard Drive Gonna Fall

Another area requiring close scrutiny is hard-drive compatibility. Many hard-drive controllers, such as the Commodore 2090A and 2091, use DMA (Direct Memory Access). The data that these drives read and write from memory may be entirely different from that which the processor sees in its internal caches unless the driver software understands the need to flush the caches before and after DMA activity. This means that your drive may not work at all or that your controller may write bad data that trashes your entire hard drive. While it is possible to limit a DMA drive controller to using chip RAM (which is not cached) for its buffers, this will slow the drive down considerably and still may not eliminate the incompatibility.

The bottom line here is that some controllers such as the Commodore 2090A will not work with 68040 cards under any circumstances; some will work under either 1.3 or 2.0; some will work only under 2.0 and only if the driver software is updated (the Commodore 2091, for example, requires a revision 6.9 ROM upgrade); and some will work, but will actually be slower when used with a 68040 board than with a 68030. Perhaps for this reason, all of the manufacturers of A2000 accelerators under review here plan to offer a hard-drive interface option for their boards (currently controller hardware comes standard only on the CSA board). If you are considering using a 68040 board with your current hard drive, be sure to find out if your controller will work properly before you buy the accelerator.

Floating Along

One of the more important innovations introduced by the 68040 processor concerns floating-point math op- ►



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erations. Such high-precision math is used by only a handful of applications, but these include 3-D graphics and video-related programs that are among the most popular on the Amiga. Older accelerators allow you the option of adding a 68882 math chip, which greatly speeds up these complex math operations. The 68040, however, has many of the floating-point math instructions built in. This gives the '040 accelerators the potential to run 3D graphics programs many times faster than any previous board; but because of the differences in implementation from the separate coprocessor chips, some software may need to be rewritten in order to take full advantage of that potential.

The real problem is that there is not enough room on the chip to include all of the floating-point instructions that are supported by the math chips. The most common functions such as addition, subtraction, multiplication, and division are included, but the more exotic trigonometric functions are not. In order for the 68040 to be compatible with code written for the 68882 coprocessor, therefore, the system must emulate the missing functions in software.

Even though, in theory, these software functions should be as fast or faster than the hardware math of the 68882, in practice they may be slower. As a result, some floating-point instructions are many times faster on the '040 than on the '882, while others are somewhat slower. In most cases, the fast instructions outweigh the slow ones, but some programs that make heavy use of trigonometric functions and ROM constants may run at about the same speed on the '040 as on the '882, or even a bit slower.

In the course of this review, I rendered several pictures on each board using both the Video Toaster's LightWave and Imagine. In most cases, the 25 MHz 68040 boards rendered the images three or four times faster than a 25 MHz 68030 accelerator with a 68882 coprocessor. One of the LightWave pictures, however, took almost the same time to render on either kind of board, and the same was true of an old Turbo Silver (Impulse) 3-D image as well.

Although the overall rendering performance of the 68040 boards is already extremely impressive, it is likely to become even more so in the future. The software-emulation instructions may be further optimized, but, even more important, 3-D graphics software may be rewritten to take advantage of the 68040's strengths. The operating speeds of applications software could potentially double by making heavy use of the fast on-chip instructions and avoiding the slow, software-emulated ones. Before that can be done, however, compiler manufacturers must make 68040 math libraries available to software developers.

Aside from speed variations, about the only incompatibilities caused by the on-chip floating-point unit are with programs that test to see if a coprocessor chip is present. Version 1 of LightWave 3D, for example, does not recognize the 68040 as a math coprocessor, so the Video Toaster loads the slower, nonfloating-point version of the program. In order to get around this, you must copy the LightWave.FP and Modeler.FP to the LightWave and Modeler files, respectively, so that when the Toaster thinks it is loading the slow version, it is actually loading the fast one.

As with the 68030 chip, the 68040 has an on-board Memory Management Unit (MMU). The actual operation of this chip is different enough from the '030 version, however, so that programs that try to use the MMU (to move the Kickstart to 32-bit RAM, for example) won't work. The few programs that use the MMU will need to be rewritten for the 68040.

68040
Accelerators: A Comparison

IN TESTING THE three A2000 68040 accelerators—the Fusion Forty from RCS, the Progressive 040/2000 (in both the 28 MHz and 33 MHz models) from Progressive Peripherals, and the 40/4 Magnum from CSA—the actual installation of the boards and their associated software proved a snap compared to the preparations that were required beforehand. (The A3000 board—the 040/3000 from Progressive—was more difficult to install, however, than the ones for the A2000.)

First, I had to install the Kickstart 2.0 ROM in my A2000 and the Workbench 2.0 software on my hard drive. (I actually used the MultiStart II board from DKB Software, which allowed me to switch between Kickstart 1.3 and 2.0 ROMs during the tests.) Next, I had to swap hard-drive controllers. The Microbotics Hardframe DMA controller I had been using was not compatible with some of the accelerators, so I switched to a GVP Series I controller with the FAASTROM option. (The GVP is a processor-controlled board that works with all the accelerators tested.) Because both of these controllers support Commodore's Rigid Disk Block standard, the substitution involved simply unplugging the one and plugging in the other.

Trying out these boards with my favorite programs and witnessing the speed increase was a real pleasure, but devising rigorous speed tests was another matter (see the sidebar "68040 Benchmark Test Results"). The problem here is that the standard benchmark programs are all fairly small, and most run almost entirely within the 68040's internal cache. This makes it very difficult to differentiate among the performances of the boards.

For example, in the AIBB3 Integer Math test, both the CSA and RCS boards, which run at 25 MHz, were exactly 207.14% as fast as a standard A3000, while the 28 MHz Progressive board was 231.38% as fast, a result that could have been predicted almost precisely by the clock speed of the board. While there are exceptional cases, for the most part the large caches act as a great leveler, making the boards' per- ►



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68040 Benchmark Test Results

ALL BENCHMARKS ARE probably suspect by their very nature, but the tests performed on these '040 boards are particularly so. Many of them are small programs that run completely in the caches, which means that there is almost no difference among boards that run at the same clock speed.

Also, the test programs have not been optimized for the 68040 processor and for this reason do not give a clear idea of the full power of this chip. Keep in mind that, for all practical purposes, results within about 10% of each other can be considered virtually identical.

AIBB3 Test Results

All tests were conducted with advanced processor code and in-line floating-point instructions where applicable. Results are given as percentages of standard (68030 processor/68882 math coprocessor running at 25 MHz) Amiga 3000 performance. (For example, a score of 200% means that the accelerated machine tested was twice as fast as the A3000, while a score of 50% means that it was half as fast.)

TEST	RCS 25MHz	CSA 25MHz	PP&S/2000 28MHz	PP&S/2000 33MHz	PP&S/3000
WritePixel	73.48%	148.94%	151.57%	168.74%	160.4%
Dhrystone	316.16%	321.74%	363.58%	422.76%	332.2%
Matrix	207.06%	209.43%	234.94%	277.65%	208.3%
Fibonacci	225.20%	225.20%	252.47%	299.47%	223.4%
Sieve	166.25%	175.00%	197.52%	231.98%	176.5%
Sort	245.37%	254.81%	288.04%	339.74%	240.9%
LLines	97.91%	93.74%	93.23%	93.32%	93.4%
IMath	207.14%	207.14%	231.38%	278.85%	207.1%
Floating-Point Tests:					
Math	75.47%	79.30%	91.10%	112.60%	78.2%
Savage	66.67%	71.25%	88.37%	104.59%	70.5%
FMatrix	213.03%	215.64%	244.10%	288.11%	216.6%
BeachBall	260.87%	327.46%	298.56%	363.99%	298.6%

Miscellaneous Test Results

These tests use Commodore's A2630 accelerator (column 1) as a basis for comparison.

TEST	A2630	RCS 25MHz	CSA 25MHz	PP&S/2000 28MHZ	PP&S/2000 33MHZ	PP&S/3000
MIPS 10000000	7.59	14.17	15.06	16.77	19.95	15.30
Imagine Ray-Trace[1] (mins:secs)	96:45	29:24	27:31	25:33	22:41	27:10
Simple LightWave Scene[2] (min:secs)	20:10	5:50	5:09	4:40	4:13	NA
Complex LightWave Scene[3] (min:secs)	73:00	66:00	64:00	58:17	50:10	NA

Notes:

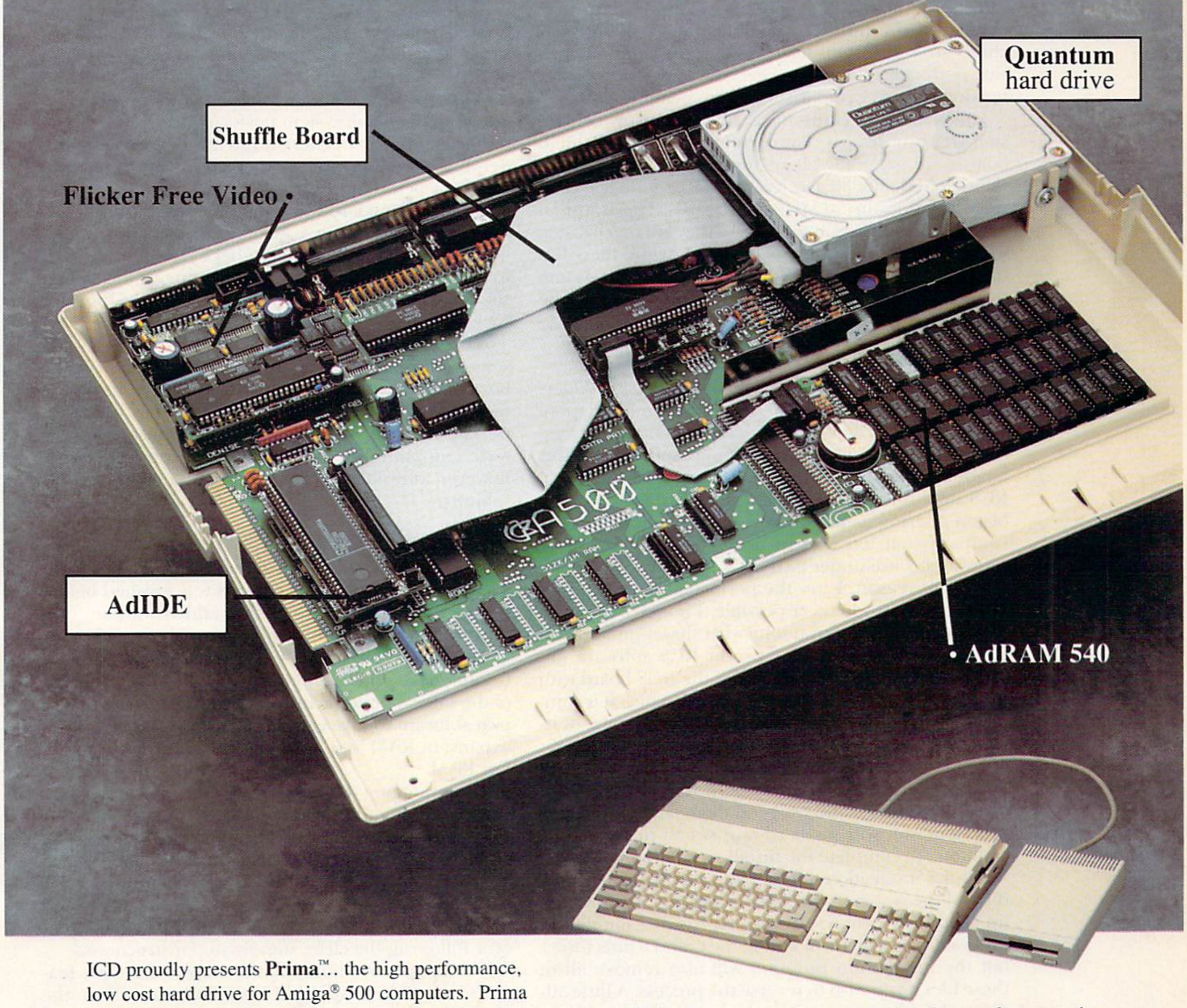
[1] The Imagine scene was a complex one with several objects and colored light sources.

[2] The simple LightWave scene was the Apple object, two lights, and shadows turned on.

[3] The complex LightWave scene had many complex objects involving a great deal of texture mapping and bump mapping.

Imagine scene courtesy of Paul Tyson.
LightWave scenes courtesy of Jon Tindall.

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formances very nearly equal. Actual applications will show more variation, depending on the memory design of the board, but, here again, applications may change in the future to take advantage of the new chip's strengths. Optimized programs could show a vast performance increase over the current versions, making current comparisons fairly meaningless.

Under these circumstances, about the only conclusion you can draw is that currently the 25 MHz '040 boards are generally about two to three times faster than 25 MHz 68030 accelerators and a little less than twice as fast as the 50 MHz '030 boards. This is just an average, however, as in some cases they are much faster, while in others they are much slower. Again, these figures are likely to change in the future as both system software and application software are optimized for the 68040.

RCS's Fusion Forty

The Fusion Forty from RCS was the first '040 accelerator board for the Amiga 2000 (it was announced more than 18 months ago!). Since development began long before 2.0 was available, the support software for this board was geared towards running under Kickstart 1.3. RCS developed its own software before Commodore began offering its 2.0 support library, so it is the only company that has not yet licensed the Commodore software for use under 2.0.

For this reason, I ran the performance tests under Workbench 1.3 wherever possible. I noticed, however, that many of the tests ran somewhat slower under Kickstart 2.0 when using the current RCS software (although this was not so when I ran the RCS board with the Commodore support software, with which it is compatible). RCS states that it plans to update some of its software for use with Workbench 2.0.

Installation of the Fusion Forty, as with all the A2000 boards tested, was painless. I simply removed the outer case of the A2000 and plugged the board into the coprocessor slot with its hardware switch in the 68000 position. To complete the installation, I ran the Workbench 1.3 installation software, turned off the machine, flipped the switch to the 68040 position, and powered up. The RCS system software consists of a number of program files that are placed in the C and S directories, but the installation program will also remove all of these files if you wish to reverse the process. A little additional fiddling was required to make the board run under 2.0. The only user software that comes with the Fusion Forty is a program that allows you to turn the caches on and off.

The one hardware choice you must make with the RCS board is how much 32-bit RAM to add. The board has two banks of SIMM sockets, both of which work with either one- or four-megabyte, 80ns, Page Mode SIMM modules. This means you can add 4, 8, 16, 20, or 32 megabytes of RAM, the most flexible combination of any of the boards tested (four megabytes were supplied with the test board). As with all of the accelerators, this memory configures above the normal Amiga autoconfig space, and thus it is additional to the 10 megabytes of 16-bit memory you may have in your system. This memory does not autoconfigure, but is added to the system by a program that you set for a specific amount of additional memory.

Although RCS currently does not support any other expansion options, the board does have space for two expansion sockets. There are plans to use them for a SCSI hard-drive controller and additional parallel and serial ports. RCS is also looking into other options related to enhancing system performance.

The Fusion Forty generally ran without problems under 1.3, aside from the bother of having to turn off copyback before starting or ending a program, as noted above. The board worked reliably and without any unexpected occurrences. Any performance differences between this board and the others are slight enough to be discounted and are probably due to the system software, which is still undergoing some revision for Kickstart 2.0.

Although the installation manual is adequate, it is somewhat sparse, dealing only with installation of the board and additional memory. It is written mostly in technical terms and does not deal at all with the important subjects of hard-drive and applications-software compatibility. RCS technical-support staffers, however, were able to answer any questions about these subjects.

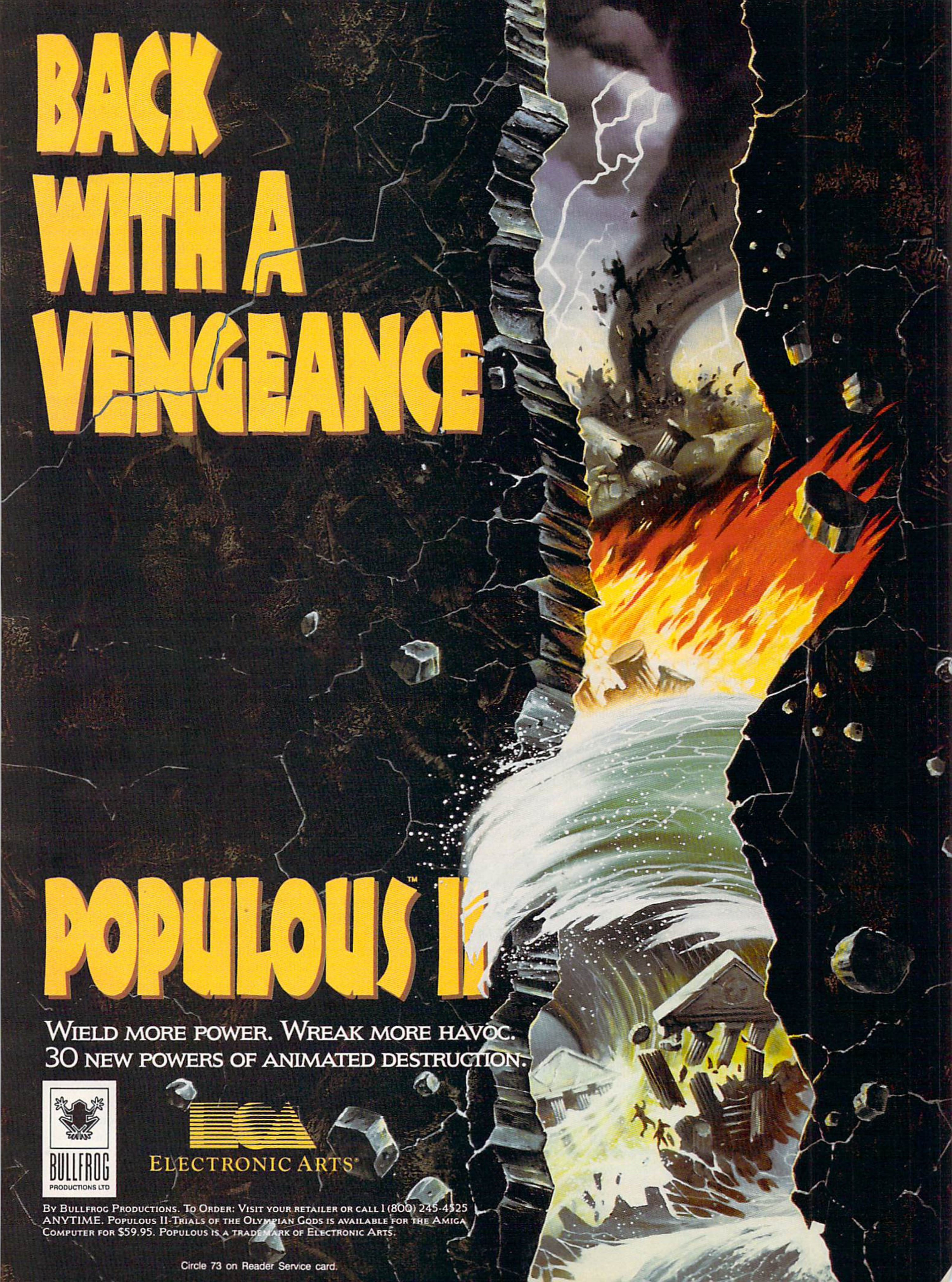
Progressive Peripherals' 040/2000

The Progressive 040/2000 was developed for use under Kickstart 2.0, but since the board was finished before the Kickstart ROMs, Progressive added software support for 1.3 as well (although it strongly recommends getting 2.0 when available). Progressive has licensed Commodore's 68040 library, which takes care of part of the software interfacing job, and it has developed its own software to take care of such chores as adding its expansion RAM and moving some system software to fast RAM.

After plugging the full-size board in the coprocessor slot, I completed the installation by copying a drawer full of software onto my hard drive and adding a couple of items to my startup-sequence file. Although there is no complete installation program as with the RCS board, there is a partial one that installs the 68040 and updated 2.0 Setpatch program. I had no trouble whatever following the clear, step-by-step instructions.

The Progressive board has a couple of unique features that you can spot just by looking at it. First, the oscillator crystal has a frequency of 56 MHz, which means that the processor runs at 28 MHz, not 25 MHz like the other two boards. (Just before completing the tests, I also received Progressive's 33 MHz version—no list price as yet—and included its results, too.) Secondly, there is a small electric fan mounted directly on top of the processor chip to cool it, instead of the metal heat sink used by the RCS board. (The CSA board currently has a heat sink, too, but CSA plans to switch to a fan in the future.)

Running at a higher clock speed provides a slight speed increase in many cases, as the test results show. It also, however, provides some additional stress on the system. It may be just a coincidence, but the Progressive board was the only one to exhibit any reliability problems. In all fairness, though, the board tested was an ►


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early unit that had been shipped back and forth across the county a number of times.

As with the RCS board, the on-board RAM-expansion capabilities of the Progressive accelerator allows you to add up to two banks of four SIMM modules each. You can use one-megabyte×8 or four-megabyte× 8 SIMMs, but you cannot mix the two types at all. This means that with the lower-density chips, you can install either four or eight megabytes, and with the higher-capacity SIMMs, a total of 16 or 32 megabytes.

The test board came populated with 32MB, which meant that I had more storage capacity on the RAM drive than on some of my hard-drive partitions. (The Video Toaster software, for example, showed that the RAM disk had room for 52 frames of video!) Although the current Progressive board has no provision for controlling a SCSI hard drive, the company plans to offer another model that includes that option.

The Progressive board has a few more configuration options than the RCS board. There are jumpers you can set to make the board autoconfigure part of the 32-bit memory into the normal RAM expansion. There is also a jumper you can use to disable the hardware caches and another to power up in either 68000 or 68040 mode. You can connect the latter jumper to a hardware switch like that of the RCS board, but this is not necessary, because the Progressive board can switch processors under software control, using the included Switch program, just as it can turn the caches on and off with the CPU040 program.

The manual for the Progressive 040/2000 is much more comprehensive than its RCS counterpart. It not only covers hardware and software installation and memory expansion in detail, but it also touches on topics such as software and hard-drive compatibility, board configuration, developing software for '040 compatibility, and troubleshooting. It contains a glossary of technical terms and a full explanation of the function of each piece of system software. Progressive also sends a useful technical bulletin to registered owners, updating new developments and compatibility issues.

CSA's 40/4 Magnum

The CSA 40/4 Magnum board was designed to be the high-end, no-compromise product in this class, with a price tag to match. It comes with a megabyte of superfast static RAM, DRAM expansion of up to 64 megabytes, a world-class SCSI controller, and parallel and serial ports. With a list price of $4000 (with 4MB of RAM), it is substantially more expensive than the other two accelerators, which come in at under the $2500 mark. The board is designed for use with Kickstart 2.0 and is shipping in very limited quantities until the new ROMs are available. The board I received came with prerelease software that did not yet support the hard-drive or I/O ports, so I tested only the accelerator.

Installing the board was as simple as plugging it into the coprocessor slot and copying a couple of programs to the hard drive. In addition to the Commodore-supplied programs (SetPatch, 68040.library, and a new CPU program that is '040-aware), it included a program that allows you to add the static RAM to the memory list and another to move the Supervisor Stack Pointer to fast RAM. CSA plans to provide additional software for controlling the use of the static RAM.

The megabyte of static RAM that comes standard with the 40/4 Magnum is one of the main features that distinguishes it from the other boards. This RAM can be accessed by the processor much more quickly than normal dynamic RAM, and if used wisely, it can provide a dramatic performance boost in certain cases. ►

Almost Ready to Fly

NOT ABLE TO make the starting field when the checkered flag was dropped for this issue, several other 68040 boards will be making their way onto the track in the near future.

The "Force" is with GVP

Nearest to delivery is ***GVP***'s **G-Force 040**, which arrived at our offices just as this article was going to press. While we did not get a chance to benchmark-test it with the others, at first glance it seems to be an impressive piece of hardware. Designed for use in the A3000 or A3000T, it operates at 28 MHz and, according to GVP, provides 22 MIPS (Millions of Instructions per Second) and up to 3.75 MFLOPS (Millions of Floating-Point Operations per Second) of processing power. To increase overall performance, the G-Force 040 allows you to add four or eight megabytes of high-speed (40ns) DRAM. With the supplied utilities, you can copy the Kickstart ROM image into this RAM to realize a significant performance boost when continually accessing the Amiga OS routines. Because the card uses an asynchronous design along with its high-speed DRAM, GVP plans to offer an upgrade to 33 MHz as soon as Motorola releases those chips.

To help extend software compatibility, the G-Force provides a software switch allowing users to move back and forth between 68040 and normal A3000 68030 modes. Like Progressive Peripheral's A3000 '040 board, the G-Force requires v2.0 Kickstart ROM and Workbench 2.0. The price for the standard configuration (0K RAM) is $2799, while a version with 4MB of 40ns DRAM lists for $3698. The product was scheduled to ship in volume by December '91.

Still More from Progressive

Not willing to rest on its laurels (but willing to mix Greek and Roman mythology), ***Progressive Peripherals*** already has plans for some second-generation '040 boards—**Zeus** and **Mercury**—to follow those currently available (see main article). Its Zeus accelerator is designed for the A2000 and comes equipped with a high-speed SCSI II interface that the company promises will support hard-disk transfers in the neighborhood of ten megabytes per second. Operating at either 28 or 33 MHz, the Zeus will also allow for expansion of system memory up to 64 megabytes, using either one-megabyte ×8 or four-megabyte ×8 SIMM modules. Progressive reports that the Zeus was designed with even faster 68040 chips in mind, with a 40-MHz upgrade a possibility.

A3000 power users will want to check out the company's new Mercury card. This 68040 accelerator will operate at either 28 or 33 MHz and will support up to 32 megabytes of on-board 32-bit RAM. The Mercury board is scheduled to ship by the end of December '91, with the Zeus ready to follow sometime in January. Prices for the two cards were not available at the time of writing.

Supra Fast Accelerators

Another '040 manufacturer with announced January shipping plans is ***Supra Corp.*** First off the line will be its A3000 model, running at 25 MHz and sporting *extremely* high-speed memory expansion, with four or sixteen megabytes of 60ns ZIP DRAM. It reportedly will also have interleaved banks for fast burst modes.

The product name and price were not yet determined at the time of writing. Supra plans to follow up with a 68040 board for the Amiga 2000 shortly after the release of its A3000 product. □

—LW

One example of this can be seen in the results of the AIBB3 "BeachBall" test, which is intended as a 3-D rendering comparison. The Magnum board was about 25% faster than the 25-MHz RCS board and even about 10% quicker than the 28-MHz Progressive board.

CSA plans to include software that will allow mapping the 512K Kickstart to this RAM without using the MMU, which should speed up some operations. The company also plans to allow software developers to allocate this special fast memory directly from their programs in order to use it where it will do the most good.

The Magnum's DRAM scheme is also different from that of the other boards. It has four SIMM sockets that can hold 1×32 or 4×32 SIMMs. It is the only board that can autoconfigure this 32-bit memory without requiring you to run a separate program. These SIMM modules are a little more expensive and harder to find than the 1×8 and 4×8 types, but they can be used individually instead of in banks of four. Using the current generation of four-megabyte SIMMs, you can add 4, 8, 12, or 16 megabytes. When the 16-megabyte SIMMs become cheaper and more available, you will be able to add 16, 32, 48, or 64 megabytes. You should even be able to mix and match, so that if you get eight megabytes now, you will still have room to add two 16-megabyte SIMMs later on, for a total of 40 megabytes.

Although I was unable to test the various hardware options for the CSA board, I will list them briefly. The board includes a parallel port, an AT-style serial port, a Macintosh-style RS232/RS422 serial port, and a built-in SCSI port. The SCSI controller chip is the fastest one available; according to beta testers, this controller racks up Diskperf reads of four million bytes per second with ordinary drives and up to nine million on super-fast drives. That's enough bandwidth to play full-motion digital video right off the hard drive.

The Magnum board also has a full expansion bus connector you can use to add just about any type of expansion product, such as large DRAM arrays or digital signal processors. While the tests do not indicate a significant difference between the Magnum and the other accelerators using current software, the expansion capabilities of this board give it the potential to become a development platform for some very high-speed equipment.

Progressive 040/3000

Progressive also makes a 68040 board for the A3000. Designed specifically for use under AmigaDOS 2.0, it requires a 2.0 Kickstart ROM and will not work with a 2.0 system that is loaded from disk. Like other 68040 accelerator manufacturers, Progressive uses CBM's 68040.library, which helps ensure both software compatibility and maximum system performance.

Progressive also supplies several programs to increase board performance, including FastSys, which moves some system routines and pointers to the fastest available RAM, FP040, which adds the transcendental math instructions the 68040 does not contain, and CPU040, which can be used to turn cache and burst modes on and off and to enable/disable copyback mode. Another utility, Switch, moves the system back and forth between 68040 and 68030s mode, allowing you to use programs that simply will not run on the 68040.

As with its A2000 68040 board, the company provides a comprehensive manual covering all aspects of installation, software, and a discussion of technical terms.

Installing the 68040 in the A3000 is a bit more complicated than in the A2000. The CPU slot on the A3000 is on the motherboard under the drive bays. To access it, you must essentially remove the entire contents of the A3000 case—the drive bays and power supply, all cards, and the backplane itself. Install the board in the CPU slot, positioning it just above the motherboard and below the drive platform.

Unlike the other 68040 boards, the Progressive 040/3000 does not offer any RAM expansion, although it does take full advantage of RAM within the A3000. To help keep the board cool (a strict requirement for the extremely hot 68040 chip), a fan is mounted on top of the 68040 itself. This fan gets its power from the Amiga via a supplied cable.

Once installed, software can be set to start automatically either from within the Wbstartup drawer in AmigaDOS 2.0 or by placing the proper commands in your startup-sequence. Because there is no on-board memory, there is no need to configure anything, although it is highly recommended that you do make use of all the utilities (FastSys, CPU040, and FP040) to maximize performance.

I have used the Progressive 040/3000 for several weeks, and the hardware performs flawlessly. As one would expect, every aspect of the system feels faster; software that performed well before really flies. Overall software compatibility is quite good, with most exceptions involving games that either would not load or operate far too fast to be playable. Serious applications, such as word processing, desktop publishing, and graphics, are greatly enhanced. One application that received a significant performance boost was Light24, the 24-bit paint program bundled with Impulse's Firecracker 24.

Conclusion

Is this the right time to buy a 68040 accelerator? The answer depends on how eager you are to be on the cutting edge (some might say bleeding edge) of technology. Patient types may decide that they would rather skip the high cost and the inconvenience that await the first ones on the block to buy the latest toy. Although the '040 boards are fast, they are probably a little less than twice as fast as the 50-MHz '030 boards, which by now are time-tested products with few incompatibilities. On the other hand, if you are the type of person who must have the fastest board available, and are willing to pay the price, then the '040 is definitely it.

Even if you decide to buy an '040 accelerator now, you still must choose which board to buy. Since the tests that we've conducted so far show that all of these boards are within about ten percent of each other in terms of speed, your buying decision will probably hinge on other factors. How long have the manufacturers been in business, and how good is their customer service? What features are you looking for now, and what features might you need in the future? With this introductory guide and a little investigation, you should be able to find the board that is right for you. Whichever route you go, you are guaranteed a fast ride. ■

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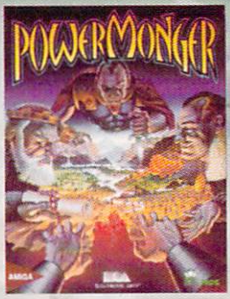
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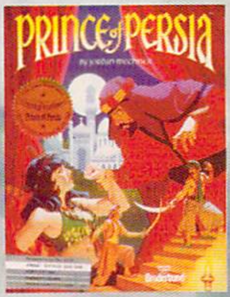
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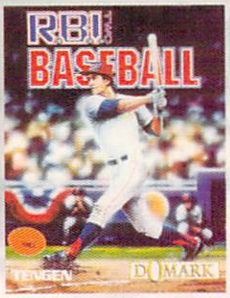
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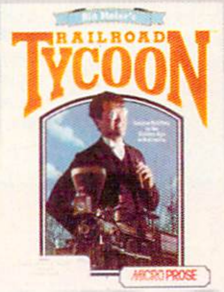
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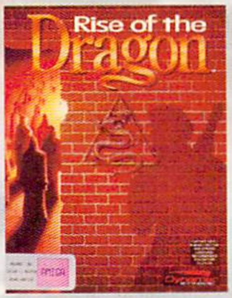
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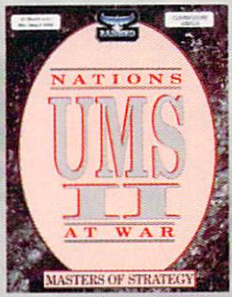
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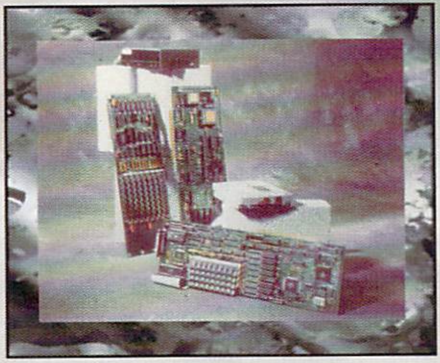
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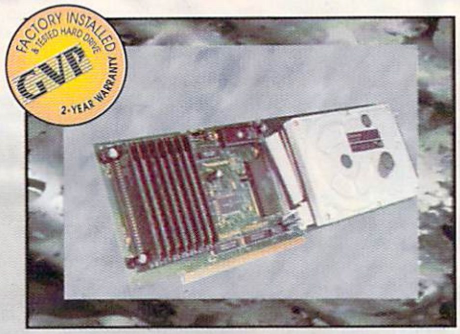
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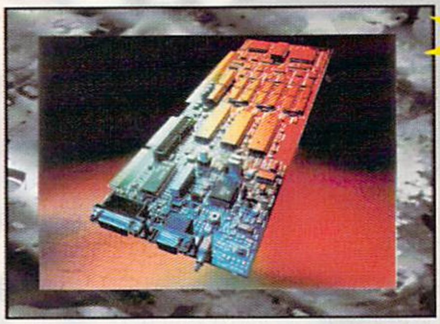
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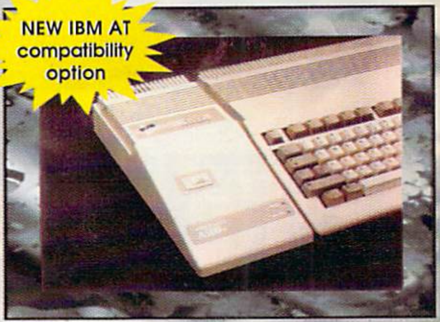


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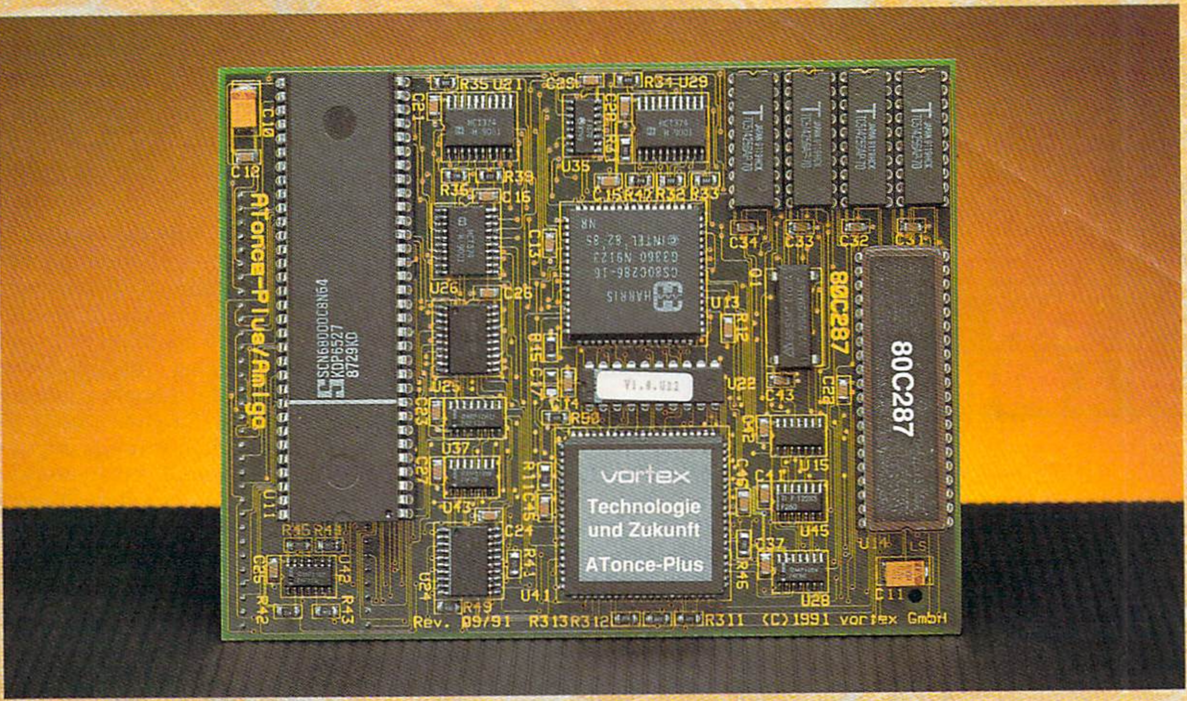
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ACCENT ON GRAPHICS

Brush-Morphing With DPaint IV

35

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

OF ALL THE new features and capabilities packed into DeluxePaint IV (Electronic Arts), one of the more innovative is "brush-morphing." It allows the user to cut two brushes and then execute an animated transformation from one into the other. Other programs can morph solid polygons, but DPaint IV is the first, to my knowledge, to offer morphing between bitmapped images.

This column will offer tips for getting the best results from this powerful new animation feature. While I use keyboard shortcuts in the examples below, there are menu equivalents if you prefer that alternative. (For more on 2-D morphing techniques in general, see "Visual Alchemy," Oct. '91, p. 29.)

Quick-Change Artistry

As a first exercise, try morphing between two simple shapes. Draw a filled red circle about two or three inches in diameter. Elsewhere on the screen, draw a filled blue triangle about the same size. Pick up the triangle with the brush cut-out tool and press the Alt-n keyboard combination to move the triangle to the Spare Brush position. This is the brush equivalent of copying a picture to the spare screen. Use the brush cut-out tool again to pick up the circle.

To metamorphose between the two brushes, press Alt-m to bring up the Make AnimBrush requester. Here, select the number of cels you want in the animbrush morph: The greater the number of cels, the more gradual and smooth the transformation will be. Enter the desired number, click OK, and DPaint will automatically create the animbrush metamorphosis for you.

You can review the result as an animation by going to Frames/Set # in the Anim menu and creating the same number of animation frames you used for the animbrush. Pressing Shift-7 puts the animbrush on cel number 1. Hold down the Animpainting key and press the left mouse button to paint each cel of the animbrush sequentially on each successive frame of the animation. Press the 6 key to play the animation, ping-ponging it back and forth. The shape of the triangle gradually rounds out into the circle. At the same time, the red shifts through intermediate colors to blue. If you are working in HAM mode, DPaint will calculate the ideal intermediate colors and values; if you are in a nonHAM mode, it will make the best choice from available colors in your palette.

As a second experiment, try loading two digitized photographic images to the main and spare screens, respectively (a pair of digitized faces would be a perfect choice here). Following the same procedure as above, cut two rectangular brushes of about the same size and morph between them. In this case, you will notice that the effect is much like a cinema dissolve: The values in one rectangle gradually replace those in the other. The software, of course, cannot evaluate the various gray levels and decide what is an eye and what is a nose to do a logical transformation of features within the image.

From the results of these first two experiments, we begin to see how to make best use of DPaint's brush-morph feature. In general, the most dramatic results are obtained from two brushes having distinct shapes. Colors and values contained within those shapes go along for the ride in a smooth metamorphosis.

"Inch by Inch, Row by Row, Gonna Make This Dino Grow!"

Animated tiles and logos are an obvious application of the brush-morph effect. In the illustration accompanying this column, the words "DINOSAUR SKELETON" are metamorphosed over five frames into a high-contrast digitized image of a skeleton. For the illustration, I have combined four cels and parts of the fifth on a single screen. In low resolution, the procedure is straightforward: The brush of the two words morphs into the brush of the

DeluxePaint IV's new "brush-morph" feature opens up a host of new animation possibilities—both simple and complex—as these examples will clearly show.

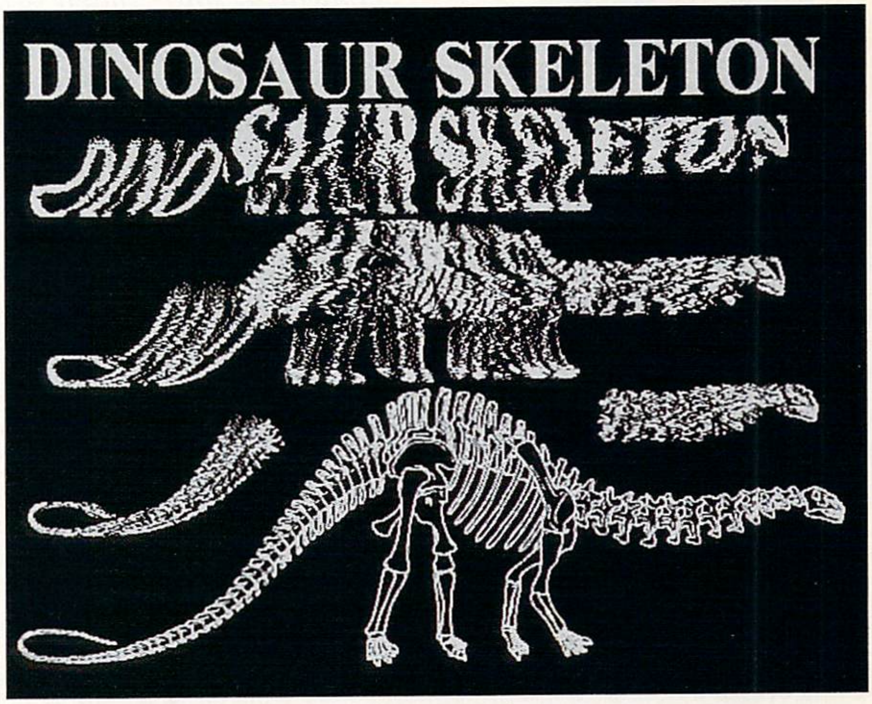
skeleton. In high resolution, the task is a bit trickier.

Morphing brushes wider than about 250 pixels is not recommended, and these particular high-resolution brushes are closer to 600 pixels wide. Even if you have one megabyte of chip RAM, the brushes are too large to morph as a whole. There is, however, a workaround solution to the problem that yields better results than if you could actually morph the brushes directly.

My hi-res morph is done in four stages: "DINO" morphs to the tail of the skeleton, "SAUR" to the hind-leg section, "SKEL" to the front-leg section, and "ETON" to the head and neck. To try the technique, cut the first brush, "DINO," and press Alt-n. Cut the second brush from the skeleton with the right mouse button, removing it so each brush can later align seamlessly with its neighbor. For this example, try a five-frame morph as shown in my illustration. These brushes are small enough to morph, even with a standard Agnus chip. When you have created and saved all your animbrushes, make a five-frame animation. On frame 1, stamp the original "DINOSAUR SKELETON" words in place. On the last frame, stamp the skeleton image itself.

Loading the "SAUR" animbrush first, go to the spacing requester by selecting the line tool with the right mouse button. Select N TOTAL and set the number to 5. Carefully positioning cel 1 of the animbrush directly over its counterpart "SAUR" on frame 1, hold down the Animpainting key and roll back to frame five of the animation by pressing the 1-key. Hold down the left mouse button and drag the animbrush toward the appropriate rear-leg section of the skeleton. Each cel of the animbrush is displayed in a line, making it easy to position the last cel precisely over the skeleton image. Release the mouse button to draw the cels sequentially on each animation frame.

Each cel of the remaining animbrushes should be positioned by hand,



Using the new brush-morph feature in DPaint IV, the author has metamorphosed a title into an image over a five-frame animation. Four separate animbrushes are combined in this effect. The isolated head and tail show the fourth cels of two of these animbrushes.

frame by frame. Don't try to make the brushes follow some automatic path. Align them manually with the key cels you now have in place. In that way, the changing image can be artistically unified frame by frame as in the illustration. I have found that doing a metamorphosis in sections in this way preserves more detail than doing the whole thing in a single pass. Also, don't be afraid to touch up each frame of the finished animation. As good as the software morph is, it can always be enhanced by the eye and hand of the artist. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.

VIDEO SUITE

Digital Layering

While traditional methods are quite costly and complicated, your Amiga can minimize the price and simplify the process.

By Mark Swain

CONSIDER AN ANIMATED show opener: A row of squares moves slowly on the left side of the screen. After a few moments, the screen is filled with dozens of different graphic shapes that move over and under one another along their animated paths. Next, the word "Digital" shoots from the right side of the screen, and "Layering" navigates up from the bottom. The two text elements center as several rows of yellow spheres beam across the multitude of graphic brilliance.

The above is an example of digital layering, an electronic method of stacking or layering multiple video elements. In it, each element resides on its own level (layer) allowing other elements to move behind and in front. Consider a show opening that contains several boxes of live video that move across the screen. Some move faster than others, and some appear behind or in front of other boxes. To create this in the traditional manner, you record the first layer to tape 1. Next you use tape 1 as the background for the next layer, which you key over (overplay/genlock) and record to tape 2. Tape 2 now contains both layers and is ready to be the background for layer number 3. Simply continue ping-ponging video tapes until you record all the layers.

Video-generation loss is the main problem with this type of video layering. For example, if an animation has five layers, then the first layer after five edits will be a fifth-generation video segment. This means that there is a limit to the number of layers that you can edit with standard analog videotape recorders. Two very expensive solutions are digital video recorders (D1, D2), and digital disk recorders (A62, A64), which can record multiple times with virtually no generation loss. The quality of the first layer will be as good as that of the last. The drawback is their exorbitant cost. Fortunately, these recorders are becoming common fixtures in post-production houses and are available for production rental. The cost per hour depends on the device, but it ranges from $150 up to several hundred an hour.

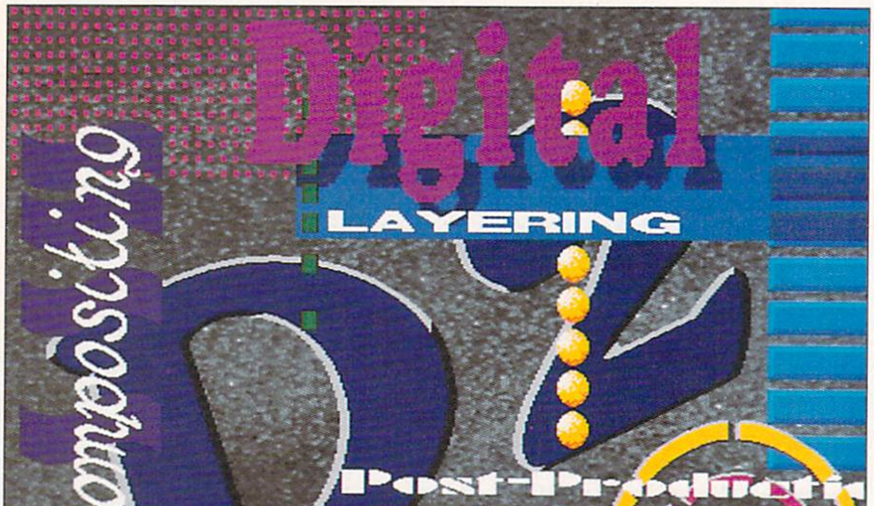
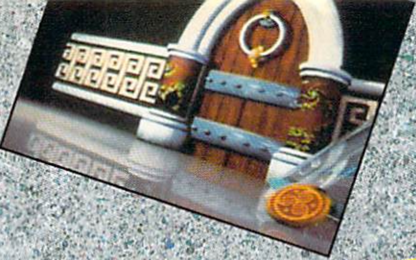


Figure 1. The final Amiga output after detailing each of the objects.

Animated Storyboards

A factor that can lower the production cost of video layering is good organization. This sounds like common sense, but keeping track of 15 to 30 layers of graphics, text, and video can become confusing and cost you time and money. The Amiga is perfect for off-line, high-end animation design. With it, you can quickly design and animate graphic elements for an animated storyboard, which goes beyond a simple list of notes and pencil sketches. It gives you a clear picture of the necessary elements, the timing for each, and on which layer each element resides. ►



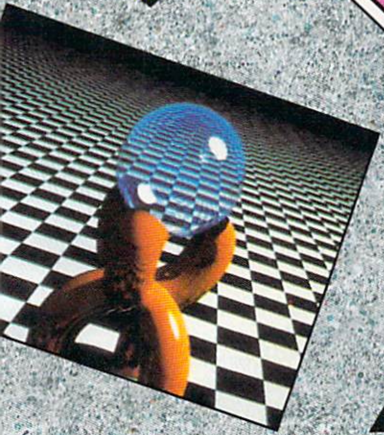
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Having this information in a post-production house definitely speeds up an edit session.

The animated storyboard is basically a moving blueprint, a simplified version of the animation project that can be followed for high-end post-production or 3-D computer animation. The graphics need be only a representation of the various elements that will be in the finished animation. The best way to create an animated storyboard is with DeluxePaint III or IV in lo-res or lo-res interlaced nonoverscan.

ELEMENTS

When starting a layered animation project, I like to build several graphic pages of elements. I can then load these to the scratch page in DPaint and access them quickly while animating. Painted graphics, shapes, digitized images, 3-D renderings, animbrushes, and text are all perfect for layered animations.

Shapes: It's usually a safe bet to start with a few basic shapes such as squares, circles, and triangles. These work well when stacked in horizonal or vertical rows. Remember, for animated storyboards, it is not necessary to have detailed elements; a silhouette of the element is fine.

Text: Text is hot! Commercials, music videos, and television IDs are filled with text elements that can be rotated, stretched, or enlarged to fill the screen. It is usually easy to think of a dozen words that represent the topic of your production. The one problem here is that the edges become jagged when the text is altered. To fix this, alter the text to the proper size and shape, and then trace around the edges with the line and arc tools. With the text outlined, fill it with a solid color. This process takes a bit of time, but makes the edges substantially better.

Video: If there are video elements such as digital video effects (DVE) boxes in your production, they should also be represented. You don't have to digitize live video; a square of the approximate aspect ratio and size of the video will work. Each video box should be labeled with the word "live" or "video." The videotape number, time code (Opp), and scene name of the actual live source are also very useful.

MOVEMENT AND ANIMATION

In a post-production environment, layered elements are animated using a DVE device, which can shrink, rotate, and move a video source around the



Figure 2. A 17-layer storyboard animation, with each layer labeled to help in post-production.

screen. The layered animation is created one element at a time, using the DVE to move the element in a key-framed path. DPaint has its own built-in DVE unit, the Move register. The DPaint DVE will also shrink, rotate, and move an element (a brush) around the screen. You can, therefore, create an animated storyboard by using one element at a time and animating that element via the Move register.

Start the animation project by loading your page of elements into DPaint. This will prepare your animation for the correct resolution and palette.

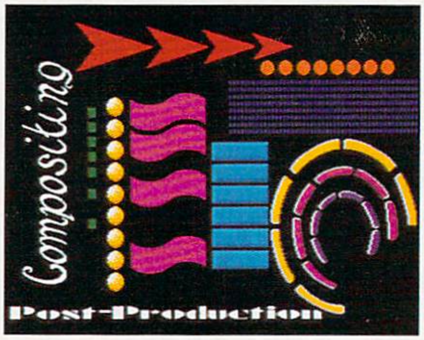


Figure 3. You can quickly access elements on the scratch page while you are animating.

Next, hit the J key to create a series of blank animation frames—90 to 120 is usually a good starting point. For best speed and visual clarity, use color register 0 as the blank background. Now you are ready to start layering. As you select elements off the page, place a number and a direction arrow in one or more locations on them. The number represents the layer and allows easy dissection of the animation after all of the layers have been added. The arrow shows the direction the element is traveling and is helpful when viewing only one frame.

To create a layered animation, you must start with the bottom layer and work up to the top. On the element page, create a brush of the bottom-most element and return to the blank frames. Stamp the brush down in the location where you wish your element to start its path, and press the u key to remove the graphic from the frame. This records the starting position of the element that the move register will use. If an element is to start off the screen, it may be necessary to relocate the brush handle. For example, to start a horizontal row of squares off the left side of the screen, move the handle to the right-most portion of the graphic. Stamp the graphic in the off-screen position that the element is to enter.

Bring the Move requester up on the number of the frame where you wish the element to start moving. In other words, if the graphic is to start on frame 1 and end on 120, then bring the Move register up on frame number 1. If the element is to enter one second into the animation, bring the Move register up on frame 30.

To animate or move the element, select the Move register and enter a value in the X, Y, or Z movement register. Remember your coordinate system and enter positive or negative values for the correct movement direction. Preview the layer's movement several times to tweak the animation's direction. If you have a great number of frames in your animation, you can obtain quicker previews by entering 10 or 15 in the frame-count register. Once it's previewed to your satisfaction, record the layer to all frames by selecting the Draw command. Press the J key and select another element as a brush. Return to the animation and create the movement for the second layer. Repeat the process for each additional layer.

DPaint IV has an added feature that allows you to save the settings from the Move registers. This is very handy if you are planning to detail your animation for output directly from the Amiga. After recording each layer, save the Move register's settings as the appropriate layer number. When you recreate the animation after detailing each of the elements, you can simply reload each layer's movements.

Rotation of elements is also possible. The key to rotating elements is the placement of the pivot point, which is ►



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the brush handle's position. For example, you swing or pivot a logo into the animation much like a swinging door. The logo's pivot point will need to be changed to either the left- or right-most side of the graphic. Then, with correct rotation setting, the swing-door effect should work. The only problem with rotation is that the edges of the elements become jagged. If you are going to reproduce the animation in post-production or 3-D animation, however, this is no problem.

Amiga Output and Chains

All is not lost if you are not planning to produce animations for post-production or 3-D computer animation. The Amiga is a fine output device for a simulated layered animation if you have an NTSC encoder or a genlock. The process of creating the animation is the same as used for animated storyboards. The difference is that the elements are detailed with textures, gradient-fill patterns, color highlights, and general gloss.

In desktop-video production, a layered animation can add extra snap to your production. Simply create your layered show opener on color register 0. Go to the last frame of your animation and add 30 frames, using the set-frame-number command. These additional frames will hold the last frame one second, allowing the viewer to see the logo. Next, cue up your live video, and start the recorder. Press 6 to ping-pong the layered animation. The animation will storm over the live video, hold on the logo, and blaze off the screen the same way it entered.

One of the tricks to video layering without digital recorders is to create as many layers as possible with few editing passes. You can accomplish this via multiple video sources. In a post-production environment, this means syncing several video recorders for a single edit, but the concept can also be applied to the Amiga. With three Amigas running different animations, you can create a very complicated layered animation.

To set up this type of system, you will need three Amigas with genlocks. With the Amigas side by side, connect the output of the third Amiga to the input of the second Amiga's genlock. Then connect the output of the second Amiga to the input of the first. Finally, connect the output of the first Amiga to the input of your video recorder.

This method has a number of advantages. The first is that you can load each of the Amigas with a different type of animation. For example, the first Amiga (or the bottom layer) could contain a background and a few slow-moving elements. The second could have a 3-D HAM animation. The third (or the top layer) could have a few fast-moving elements that are slightly transparent. You create the transparent effect by sliding the fader 50 percent on the video input of the second genlock. A second advantage is that each computer is independent, letting you loop one animation and hold on others. For example, the first and third layers might be set to loop their elements. The second Amiga could contain the logo animation and be set to play once. The final animation would have elements continuously speeding in front of and behind the logo.

Frame Buffers

Amiga frame buffers are a great source of backgrounds for layered animations. You simply create the layered animation on color register 0 and overlay the animation of the 24-bit framebuffer output. For example, the Video Toaster (NewTek) works very well for this task. First, load the Video Toaster and a background or frame into framebuffer 1. Exit the Toaster. It will now overlay all Amiga graphics over the framebuffer image. Connect the program out to a recorder and play the layered animation.

While I haven't used one, the ColorBurst (Centaur Software) framebuffer is reputed to work in a similar manner for overlaying Amiga graphics on 24-bit backgrounds. Other types of framebuffers require the use of a genlock: You load the 24-bit background into the framebuffer and connect the buffer's NTSC output to the input of the genlock. Now connect the genlock output to a recorder and play the layered animation.

Two-Layer Project

With the theory behind you, try this simple project: Start the animation by creating 90 to 120 blank frames. Press the J key, create a vertical row of squares, and select the row as a brush. The squares will slowly move down the right side of the screen. The element is to start off the top of the screen, so move the brush handle to the bottom edge of the graphic. Next, stamp the brush off the top-right corner of the screen. On frame 1, bring up the Move register. The animated row of squares is to move down the screen, so enter a negative number (–250 or –450, depending on resolution) in the Y direction.

To see a 15-frame preview of the layer, enter 15 in the frame count and click Preview. If the row of squares did not completely exit the bottom of the screen, increase the number in the Y register and preview again. Once the animation meets your satisfaction, enter the total number of frames (90 or 120) in the frame count and click Draw to record the layer's movement into all of the blank frames. Play the animation to see the final result of the first layer.

The second layer of the project is the logo "Digital," which will shoot out of the right of the screen over the row of squares. The Logo should stop in the upper center of the screen. Go to the last frame of the animation and stamp a brush of the logo in the top center of the screen. Then press the u key to remove the graphic from the frame. This records the target (or final) position of the logo. The Move register can move from or to a target position. In this case, the logo will move to a target, so select the arrow button pointing at the dot in the direction portion of the Move register.

Next, the layer will be recorded backwards from the last frame to the first. Select this option in the Move register's record-direction portion. The final setting is the movement direction. In this case, the element is moving in the negative X direction. The only hitch is that the animation is going to be recorded backwards, so the element will move in the positive X direction. Enter a positive distance in the X direction; the bigger the number, the faster the logo will move onto the screen. For elements that go to a target position, the ease in and out (5 to 10 each) makes the animation appear a bit smoother. The layer is now ready to preview. Once it is tweaked to your satisfaction, click on the Draw button to record the element's movement to all frames.

You're finished! Now, play the animation to see both layers animated in real time. ■

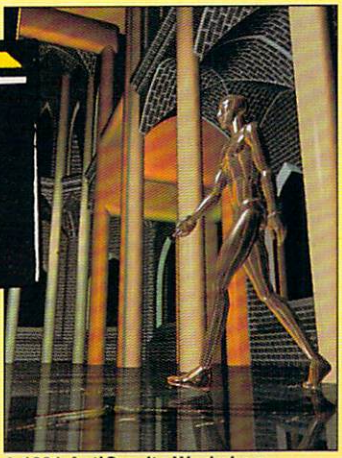
Mark Swain is a California-based freelance writer who does video post-production and computer animation. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

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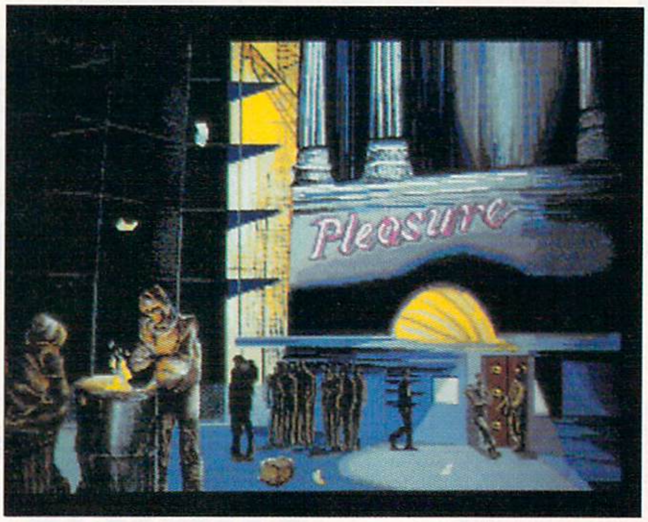
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THE GAME PRESERVE

Rise of the Dragon

By Peter Olafson

The first thing you notice about Dynamix's Rise of the Dragon (ROTD) is the pleasant heft of the box. At ten floppy disks and 7.4 megabytes, this dark-future detective fiction is the largest Amiga game to date (surpassing the eight disks of parent company Sierra's Quest for Glory II). "Hard disk highly recommended," reads the product information sticker, and they aren't kidding.



L. A.'s underside in the year 2053.

Big isn't always good—sometimes it just means a more elaborate mess—but ROTD ($59.95) *is* pretty good. It comes lavishly appointed with sombre music (there seems to be a different theme for every scene), 32-color graphics, and a supply of delightful incidental animation—papers blowing, construction cranes at work, traffic passing.

They are only a small addition, but these flickers of life add a lot to the game. You always have something to look at, something to play with, some bit of fun to have that doesn't strictly advance the story.

If you're a fan of the movie Blade Runner, you'll probably get a kick out of ROTD. The year is 2053, and Los Angeles looks as though someone has bombed it. (Maybe they have.) You're cast as Blade Hunter, a former cop summoned back into action (on the sly) when the mayor's daughter falls victim to a dangerous drug.

Naturally, there's more to the game than drugs; they're just part of a plot heralding the emergence of a demon-to-end-all-demons (hence the title). Blade must use his wits and limited diplomatic skills to cut through this web of intrigue, and at several points in the game he can cut through enemy henchmen in horizontally-scrolling arcade sequences.

These beat-'em-ups fall somewhere between Rolling Thunder and Persian Gulf Inferno; if you don't care for that kind of thing, set the difficulty level to easy or skip them entirely. Arcade action doesn't dominate the game, but I do wish you had to use your wits rather than your wrists to get through the final sequence.

Most of ROTD is played through the point-and-click window interface also featured in Heart of China and the Adventures of Willie Beamish. It seems like the most natural thing in the world: Click on the little picture of Blade to call up an icon-based inventory, then arm him by dragging the pistol over to his GQ-ish form, and he appears with the weapon in hand and wearing an enraged look. (Don't forget to drag over his clothes, too, before he ventures outdoors!) This scheme is cute, although it ►

Crib Notes

By Peter Olafson

Avast, ye pasty-faced, computer-game playin' swabs! So ye thought a belly full of egg-grog would shiver me timbers! Well, ye be mistaken. I'll tell ye the Secret o' Monkey Island (Lucasfilm) if it be's the death o' me. Which it might have been, lad, only I was already dead!

Now, let's just see if we can recall whar we left off... As you may remember, in November's isssue we'd just arrived on Monkey Island, with buried head and toasted rump, and a whole new set of puzzles. Let's make a quick tour of readily grabbable objects: spyglass; rope; gunpowder and cannonball from the fort on the northern rim of the volcano (straight north from your starting point); and flint (the "notable-looking rock" at the river junction to the northeast). Did I tell you to grab the banana on the beach? Get that, too. And be sure to read the papers you'll find scattered about.

Following the dry riverbed southeast from the river junction, you'll find a dry pond with a fellow strung up in a tree. He's beyond help, but you sure could use that rope—as you know if you've visited the ravine northeast of the starting beach.

You can't lower the strung-up fellow, so raise the river. You probably noticed there's a dam blocking the stream, and you've got just the equipment to put a hole in it. The gunpowder part is obvious, and there are (at least) two available ways to set it off: using the flint with the cannon ball or using the spyglass. Have at it.

Now you have enough rope to

Continued on p. 92.

To locate developers of the games reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 120.



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seems to tax the machine, and summoning an inventory should be a snap.

The story is easy to follow, but you're bound to be distracted by the many opportunities to fool around—collecting odd bits of info and inside-the-industry humor, or experimenting with things you just know you shouldn't do. (Try responding to the advances of the receptionist at City Hall, for example.) Naturally, you saved your game first—right? There's a slew of saved-game positions.

The puzzles are clever, the solutions are realistic and varied, and there's a pleasant emphasis on conversation. Not to mention electricity: This game requires more wiring and rewiring than you probably do in your home.

In the best spots—notably the enemy headquarters in the endgame—you could cut the atmosphere with a blowtorch. The music does its job superbly, from the first "It Came From the Desert"-like strains in Blade's apartment to the frightening end.

For all its weight, this adventure is small in scope, with just eight areas, encompassing 50-odd locations, to explore. It's the sort of game a persistent player can finish over a rainy weekend, and I've heard of people finishing it in one night.

Thank goodness, then, that Rise of the Dragon was built so that you can replay it, with a number of less-than-obvious plot branches built in. For example, I went through the game without visiting Blade's girlfriend's apartment or the reservoir, and without using the hovercar.

The graphics are good, although a bit chalkier than the VGA original. But it's surprising what can be achieved with 32 colors!

Loads, even from a hard disk, are slow enough to be exasperating if you're the impatient sort. I'm also disappointed that the detail level—which controls the amount of animation—is glued to the minimum on Amigas with 512K of chip RAM. You need a megabyte to play the game, and at least a megabyte of chip RAM to see ROTD in its full glory.

That said, Rise of the Dragon is another promising outing by Dynamix—not just a big game, but a pretty good one. It doesn't quite breathe fire, but there's plenty of smoke.

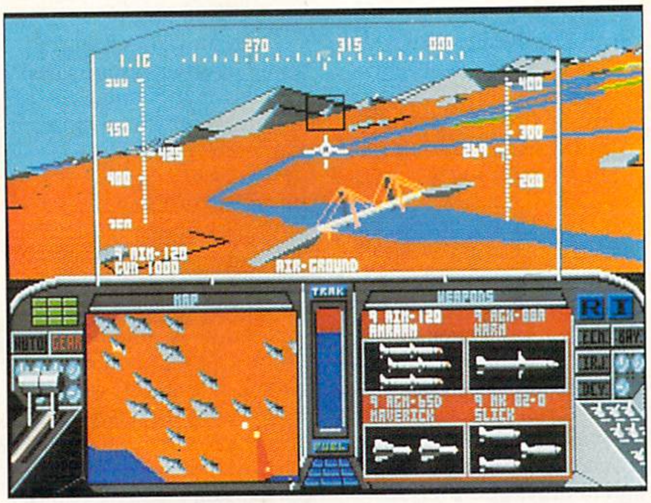
F-19 Stealth Fighter

By Rob Hays

F-19 Stealth Fighter (MicroProse, $69.95) is on the other side of the flight-simulator coin from Strike Eagle II, which was reviewed in the November 1991 issue of *AmigaWorld*. Whereas F-15 pops you right into the action, F-19 involves you in the entire range of duties required of fighter jocks.

Each mission begins with an intelligence briefing, during which you're assigned your primary and secondary targets, decide on armament, and plan a flight path. The computer selects specific targets for your mission and gives you a chance to back out if you think the assignment is beyond your capability.

After takeoff, you must monitor enemy surface and air radar activity, manage your fuel resources, and navigate into and out of the target areas. The opportunity to choose from four geographical hot spots, three levels of conflict, four levels of opposition, and three levels of landing difficulty ensures that you always have room to improve your skills. You can also choose to fly training missions with neither risk of damage from enemy fire nor points awarded toward promotion.



There's trouble in the air.

Although F-19's sound effects are minimal, the graphics are well done, with a reasonably fast frame rate. Several nice touches include the thumb that clicks the slide-projector control as you cycle through mission options and the throttles that move as you make power adjustments.

MicroProse has done its usual fine job of packaging, with keyboard overlays, map sheets, and a nearly 200-page manual. F-19 was converted to the Amiga in England, and typically can't use any extra memory or disk drives. The program is covered by both disk- and manual-based copy protection, but lets you keep pilot data on a nongame disk. Thankfully, files are arranged so that swapping between the three (or four) disks is minimal.

F-19 Stealth Fighter requires 512K of memory and runs properly on the Amiga 3000. Choose it if you're looking for a flight simulator that requires more than "aim and shoot."

Hard Nova

By Peter Olafson

I took a shine to Hard Nova (Electronic Arts, $49.95) right from the start. It's hard not to get a kick out of the crowd in the bar upstairs on Mastassini: a motormouth kid, a faded blonde, a psychotic gunner, a huffy businessman (vaguely reminiscent of Donald Trump), a crooked evangelist, and a drunk from another merc ►

outfit. Merc means mercenary, by the way.

We told the kid and the businessman to get stuffed, ignored the blonde, punched out the merc, and hired the gunner. (She took care of the evangelist in her own special way.) Then I lost my shirt at the roulette table, watched the fish in the aquarium, and found a case of my beverage-of-choice, Hot Mud. Things didn't look so bad after all!

In this science-fiction role-playing game, you're cast as either Stark or Nova (nice to see a female in a lead role). Your character is a hired gun from the Starkiller merc group, out of Holbrook, that's just lost a crew to a meteorite hit. Replacing them is your first task.

Once you have your crew back together, you'll want to spruce up your equipment and abilities and then set about exploring the four two-planet systems of the Spiral Arm. Along the way, expect to face unfriendlies eager to introduce you to a vacuum (some nice combat-related options here), do a little smuggling to pay the rent, and tackle missions for your boss who's back on Holbrook.

The graphics are basic by Amiga standards, but not shabby, and the angled-down, Populous-style view of the surface building from near-space is especially nice.

That brings us to a high point in the game—a host of lively and elaborate conversations with folks scattered throughout the sector. Some of these chats are vital, and some just for fun and atmosphere. Many of the folks mature from talk to talk, and most offer at least a couple of approaches. (Another good way to collect data is from the disk viewer aboard your ship.)

Hard Nova is a friendly game in other respects, too. It runs on any Amiga (including the 2500) with a hard disk or two floppy drives, although you need a megabyte or more of memory to play from a hard drive. The copy-protection questions don't require word 18 on line 45 of page 86.

A couple of tune-ups are needed if there's to be a sequel. The game's world is rather small for a role-player, and Hard Nova proceeds fairly quickly once you master the ship's systems (which may take a while). The keypad—the best way to control your ship—isn't as responsive as it ought to be, and ship movement could be more fluid. Saving a game seems to take an eternity. (No wonder, as each saved-game file runs to about 270K.)

The opening musical score, which replays every time the ship enters a stargate, is terrific, but otherwise there's little sound, and what there is seems oddly disembodied.

In short, Hard Nova could be a better, but as a game, period, it issues a pleasant light. Pour yourself a Hot Mud, and have a look.

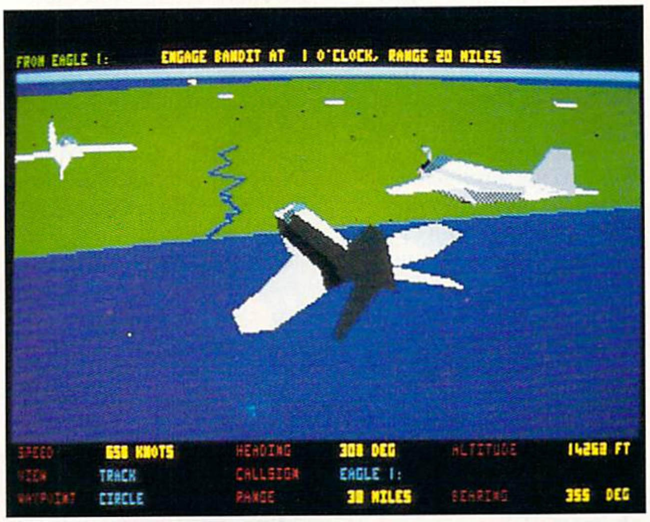
FLIGHT OF THE INTRUDER

By Jeff James

Set in the 1972 Operation Linebacker air campaign over North Vietnam, Flight of the Intruder (FOTI), from Spectrum Holobyte ($59.95), is loaded with realism and extensive playing options.

The program comes on two nonprotected disks, accompanied by a hefty 216-

page manual, a keyboard reference card, a copy of Stephen Coont's novel, after which the game is named, and a full-color map of the area covered by Operation Linebacker. The hard-disk installation routine makes copying FOTI to your hard disk easy.



Ready to fly in Operation Linebacker?

After installing the game, you're off to the USS Shiloh, the carrier from which you'll fly strike missions against communist North Vietnam. The missions begin in a briefing room, where you view aerial photos and other intelligence on the target area. You can fly either the F-4 Phantom or the A-6 Intruder, and then customize your plane through a weapon-loading screen. Preparations done, you jump into the cockpit and catapult from the Shiloh's heaving deck.

FOTI provides a wealth of flight controls. In addition to all the standard options, you'll find dozens of features such as the Intruder's advanced avionics, several external cockpit views, and a time accelerator. This game is extremely realistic, and playing with the more advanced options makes it even more so. Missiles refuse to lock onto targets, the radar screen fills with static when the plane's nose drops below the horizon, and fuel declines realistically (taking into account air density, air speed, and such). All in all, the mission is a harrowing ordeal.

Thankfully, you're not always fighting solo, due to FOTI's novel treatment of friendly aircraft. Several missions involve a flight of four Intruders escorted by four Phantoms, and the program lets you jump from cockpit to cockpit. Unlike other simulators, where you take on all hostiles single-handedly, FOTI emphasizes team flying. Nothing is more satisfying than returning to Yankee Station with all your wingmen still in one piece after a pummeling by MIGs, SAMs, and antiaircraft fire. It's a nice touch that adds a welcome new dimension to an already enjoyable flight simulator.

Although FOTI was ported from the MS-DOS version, Amiga enhancements abound. The game can be installed on a hard drive in its entirety, and it offers full support for both digital and analog joysticks, as well as ►

the Gravis MouseStick. It works admirably on accelerated Amigas, supports ICD's AdSpeed 68000 accelerator, and behaves nicely when running under AmigaDOS 2.0. Although modem play is not supported, FOTI has a direct-link option that lets one Amiga link with another or an Atari ST. Linked players can fly either against each other or as wingmen on a team.

Once you've mastered all 13 FOTI missions (which I assure you won't happen quickly), you become Commander Air Group (CAG), designating your own targets and creating your own missions.

All these features make FOTI's learning curve fairly steep. That and the realistic flight characteristics of the aircraft combine to make this a very challenging game. Sixteen variables determine the difficulty level, but even at the lowest settings, success requires reading the manual and flying the simpler missions.

FOTI does have some rough spots. While it includes bad-weather missions (replete with turbulent gray skies and stormy seas), night missions are strangely absent. The sound of pilot chatter that announces incoming messages quickly becomes annoying (although it can be turned off), and the landscape seems flat and featureless, even at the most detailed settings. But these are only minor flaws in an otherwise excellent game.

Flight of the Intruder is tough; casual flight-simulator fans should look elsewhere for a less harrowing flying experience. But if you want a detailed, realistic, and challenging simulation of the naval air war in Vietnam, look no further.

From p. 86.

hang yourself—from the edge of the ravine, that is, and again from the ledge partway down. Just get the oars and come back up. Guybrush is too much the weeny to go exploring down there (and nothing's there anyway). Provided you've found the rowboat on the beach, you're now free to explore both halves of the island.

But a couple of spots seem resistant, eh? One is that fenced-off enclosure at the southeastern cul-de-sac. That fence does open, but there's a trick to it—some of those noses on the totem pole look more like levers, don't they?—and you'll need a hand.

Enter our pal the monkey. Naturally, he gets the banana, but don't expect him to get all appreciative or anything. He'll want more—four more bananas! four more bananas!—and you don't have them just yet.

So...go back to the river junction, and climb up those footholds in the cliff wall across the bridge. At the first level, you'll find a primitive sculpture whose instability is just a way of saying you can move it—or, more to the point, aim it. Use the spyglass when beside the sculpture to see what it's pointing at.

Now, you will need to climb the rest of the way to the top. Quite a view! Notice that stone at the edge? What do you suppose would happen if you gave it a nudge? Oops! Saved the game first, right? (I'm not sure it matters, by the way, but you might just want to play it safe.) The sculpture is, in fact, a see-saw catapult, and if you set it correctly you can knock down a couple more bananas from a tree. That makes three.

Incidentally, there are several positions for the sculpture, and, just for fun, you'll want to move it to each of them to see what happens. (Be sure to check the notes that appear after you do so.)

(This isn't a hint, strictly speaking, but there's a little Easter egg up here that's cute—especially for anyone familiar with Sierra's adventures. Once atop the rock, head right and walk all the way to the edge. Cute, huh?)

The remaining two bananas are available for the taking in the cannibal village north of the mountains. (They're in the bowl in front of the giant head.) The cannibals seem like an unthreatening lot, but they don't like banana thieves, and they lock you up while deciding how you should be sautéed.

Now, you know where Herman Toothrot's banana-picker is. Unfortunately, it's too big to fit through that hole in the floor (the one under the loose floorboard). Leave it behind for now, but do get the skull, and take a look at the note.

Back at the south end of the island, seek out the monkey and feed him the other four bananas. He'll follow you. Lead him back to the totem poles and the closed gate, and have him perform a little nose job. You're in!

Um, sort of in. Entering the giant monkey head will take a little more doing. For now, just spend some idol time, and get the little statue in the middle of the enclosure. Don't worry about the monkey; he'll hang around until you get back.

Head back to the cannibal village, and give them their idol. The three cannibals are as dumb as the three pirates at the start of the game, and they'll be real pleased with the "gift." Then return to your cell through the open door and get the banana-picker—which you can trade with Herman Toothrot, who resurfaces right on time—for the giant ear swab that opens the giant monkey's head. Yuck!

Next you'll need to...what? Run off and get into the monkey head? Sure, you can do that and wander around the spooky place to your heart's content. (Indeed, you *should*—just for the fun of it; Lucasfilm's computer artists had a field day in there.) However, you'll eventually notice that you don't really get anywhere.

You're missing something, and you should talk to the cannibals again after your meeting with Herman. Either wait around here for their return, or go to the village and stay until they appear. They'll probably drop a hint or two about the "navigator's head."

You need that grisly old thing (the direction it faces in the maze is the way you need to...head), and the cannibals don't want to give it up. This is one of those times when you decide there *must* be something you missed in that alley back on Melee Island.

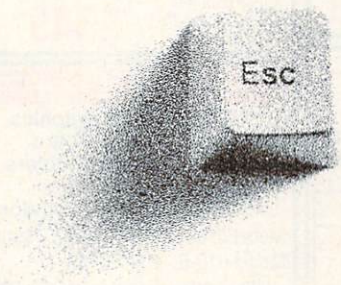
Nope. Check that wad of paper you've been accumulating. There ought to be something in there that will do the trick. Remember: The cannibals are D-U-M-B.

We're just about done. Next month we get back to normal with the tail-end of Monkey Island, Rise of the Dragon, James Bond: The Stealth Affair, and maybe some bits from Chronoquest.

As ever, if you need help with an *adventure* game, write to me via US mail at 222 Henry St., Garden Apt., Brooklyn, NY 11201, or via electronic mail on GEnie (P. OLAFSON1) or Portal (Peter Olafson). (No telephone calls puh-leez!) Send a self-addressed, stamped envelope for a personal reply. ■

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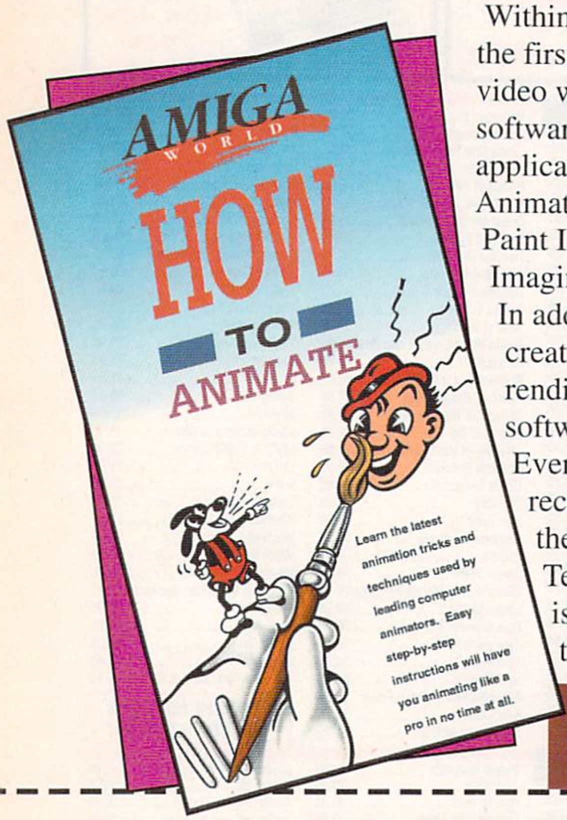
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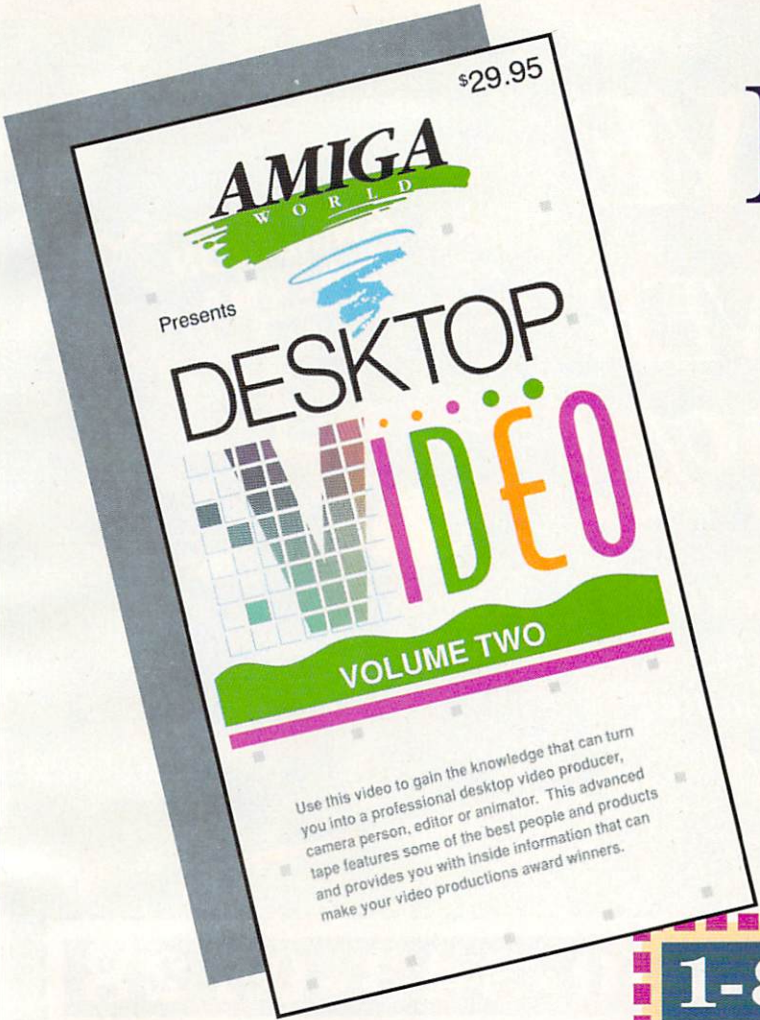
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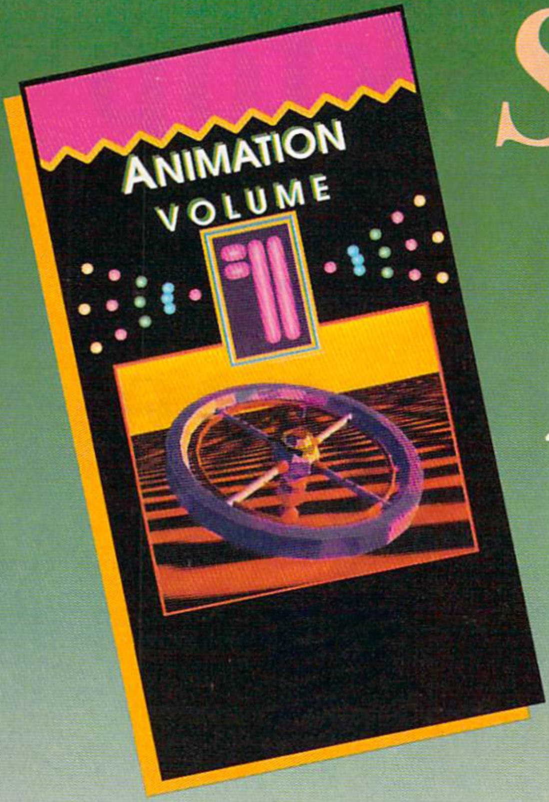
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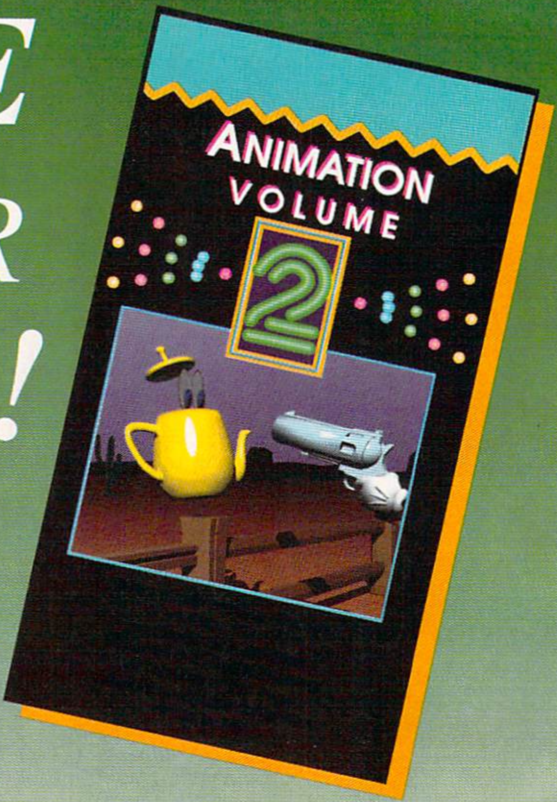
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From p. 26.
animation, and then waits for the next frame. I know of many others who are creating similarly useful and exciting applications using CanDo.

INOVAtronics also provides several add-on programs for CanDo. The ProPack ($39.95) includes sample decks, IFF resources, and documentation, and the IntroPak ($39.95) offers a 100-page manual on the included sample decks and additional tutorials. The company also offers collections of freely distributable decks created by CanDo users.

One of these, the recently released Interface Design Kit, includes a collection of clip-art buttons not only for use with CanDo but also with any interactive authoring software. With this kit, you do not need a paint program to create buttons of the same design in numerous lengths and widths. There are almost 50 screens of buttons, plus versions of each button saved as a brush. The manual shows screen shots of all of the buttons.

While I like the concept, I have a couple of problems with this collection. Once you eliminate the slight size differences and duplications between screens and brushes, there really isn't much variety on these four disks. I can't imagine anyone doing Multimedia design without a paint program, so the slight size differences between buttons is insignificant (it's trivial to change the size of most of these buttons in a paint program), and I see no need for both screen and brush versions of everything.

Also, while there are many nice and useful buttons, it bothers me that none offer alternate images so that you can animate them. If you have very limited artistic ability, however, or just want an easy way to add buttons, this collection can be useful. I just wish there were more buttons and a greater variety of them.

With the CanDo 1.5 upgrade comes a hefty manual supplement that includes not only all the new features, but also a complete index for both the supplement and the original manual. There are a number of cosmetic changes to CanDo, many of which make the program look better under Workbench 2.0.

INOVAtronics has added several new external utilities. ThePrinter prints out the contents of a CanDo deck to either a printer or a file, with information about each object's type, size, origin, and associated scripts. TheRelocator, a much-needed utility, updates a deck if you move any of its data (pictures, sounds, and so on) to different directories or change file names. TheBinder is still there to make a stand-alone, distributable version of your program, but one of the problems with TheBinder is that it adds 100K to your program, so even the most simple programs will top 100K. While it would be nice if TheBinder were intelligent, thereby adding only as much of the CanDo.library as needed, another solution is available in the DeckBrowser.

A distributable file, the DeckBrowser runs unbound decks, which saves a great deal of disk space, as you need only one copy of it to run all of these fairly small decks. Finally, ShutDownDeck is a handy utility to use when a deck gets caught in an endless loop with no other way to stop it. This can happen when you're debugging a new deck. Simply run ShutDownDeck with the name of the deck, and your runaway is brought to a screeching halt so you can continue without rebooting.

The new KeyInput object, which lets you run scripts based on key presses, gives you a lot of control. You can trigger an event by pressing a single key, by releasing a key, and by pressing several keys simultaneously. You can designate an event to repeat as a key is held down, and you can assign functions to any and all keys. There are even keycodes for the commands from DCTV's remote control.

Besides having a more "Workbench 2.0" look, CanDo now supports the AppEvent. This takes advantage of the new 2.0 App feature that lets you drag an icon onto a window and trigger a script. The buttons are more "2.0ish" as well, with a toggle option that lets you make check boxes, and you can use the new Radio Knob border style to create buttons that cycle through options. Boxes can toggle between highlighted and unhighlighted states.

New objects include an ErrorTrap, which lets you create your own error trapping; MenuRender, which changes the screen's color palette to make menus more visible before it renders them, and then subsequently restores them; and RightMouseButton, which helps you produce button-down and button-up events.

INOVAtronics has greatly improved the script editor, as well. It now provides auto-indenting and line-oriented cut and paste editing, displays information on what object you are editing, and offers lots of shortcut keys. In addition, there are two new editing tools.

The Brush Off

The most useful of the editing tools is the BrushAnim Editor Tool, which gives you much better control over BrushAnims. For example, you can draw a path to move the BrushAnim along or do point-by-point on-screen editing of the BrushAnim's path. You can save and later call back path moves for use with other BrushAnims. The SoundSequence Editor tool lets you play a sequence of sounds with volume and channel changes. In addition, INOVAtronics has enhanced The Paint Editor tool with load-brush and save-brush options.

More serious users will welcome the new support for real floating-point math and arrays (the manual provides a good explanation of arrays). CanDo 1.5 provides several commands for database creation and lets you produce multiple window applications.

Additional new features include graphics commands that let you perform region clipping, draw polygons and borders, and invoke area scrolls and copying. You can now open SubDecks and pass information back and forth from a Parent-Deck, and you can easily pass parameters between cards. You can also get disk and file information, file identification, and other functions to make your own sophisticated directory utility. Menus now permit checkmarks and ghosting, and there are six new border styles, improved string functions, and improved ARexx functioning. You can also bind text files to your program, extract images from icons to create your own customized icon editor, and much more.

CanDo has come into its own. While more features would always be welcome, (this is only version 1.5, after all), the current version is reasonably complete and powerful. It is encouraging to know that INOVAtronics is constantly improving the package. If you want to create programs without programming, or do simple audio-visual presentations (CanDo is not a replacement for AmigaVision), or simply take control of your Amiga's power, CanDo is the product for you. Further, I believe CanDo will have a serious impact

on the Amiga community, both with the power it provides, and with the useful programs created and distributed by those who own it.

DRAW4D-PRO

ADSPEC

A new dimension in structured drawing.

By Phil Fitzpatrick

WHEN I READ the back of the Draw4D-Pro package, I was skeptical—I tend to get a little nervous about software that promises all my dreams. What looked like my Christmas wish list on the outside, however, turned out to be more than just a boast on the inside.

Draw4D-Pro ($349), an enhanced, second-generation companion to Adspec's original Draw4D, is a comprehensive, highly-sophisticated, three-dimensional design, modeling and animation tool. It integrates easily with desktop-publishing and video applications, and although it is not a ray-tracing program, it provides effective simulations of most of the effects found in ray-traced images.

CHOOSE YOUR WEAPON

The software comes in two versions, one for 68000 and another for 68020/030 with 68881/882 math chips, and both require a minimum of 2MB of RAM. Installation is simple and direct.

4D-Pro supports image creation, viewing, and saving in all standard Amiga IFF formats, 24-bit IFF, and DCTV (Digital Creations) formats and can save ProDraw 2.0 (Gold Disk) clip files. If you use a 24-bit card or DCTV, you can view these supported display modes. Even if you don't, however, you can still create and save 24-bit and DCTV images. The program also provides support for 3-D fonts and comes with two basic styles and a font editor.

Draw4D-Pro has a lot to offer. There are three major areas of object-creation tools. The program provides tools for image mapping, shading, and animation control. You can implement all of these through three viewing modes: Editor, Preview, and Display. Each mode has its own screen and, when not in use, these screens close to conserve RAM. Preview mode uses a low-res screen with wireframe images to run motion tests—much like "pencil tests" in traditional film animation—while you create and assemble objects in the editor. Display mode shows you the final rendition of your images or animations, at the resolution and with the type of rendering you specify.

At first, the editor mode presents a pretty standard appearance—a menu bar across the top and a toolbar down the right side of a 640×400 interlaced screen (no options on the screen size). The most immediate difference is the Cartesian XYZ axes spinning (yes! spinning) around the origin (0,0,0) of an "infinite" three-dimensional universe. These provide simultaneous, real-time rotations in all directions. What's more, each axis is color coded so that you can maintain your bearings. You can also choose whether or not to display coordinates on the menu bar.

The editor uses wireframe images to ►

speed up the display. While the manual refers to the editor's actions as "drawing," these tools actually control primary viewpoints, free-hand polygon construction, movement, cloning, rotation, sizing, grouping and ungrouping, and reshaping of objects.

Adspec has taken some innovative approaches to Draw4D-Pro's interface. The company replaced the more familiar approach (i.e., three plan views and a wireframe perspective) with a more intuitive and accessible 3-D display—one that still lets you set the views to coincide with the primary axes during object creation. With a little practice, I was able to construct objects without resorting to these "plan" views. All objects are faceted and created from polygons. You can manipulate these facets separately, in groups, or all at once. You can also further subdivide polygons and facets into triangles or rectangles.

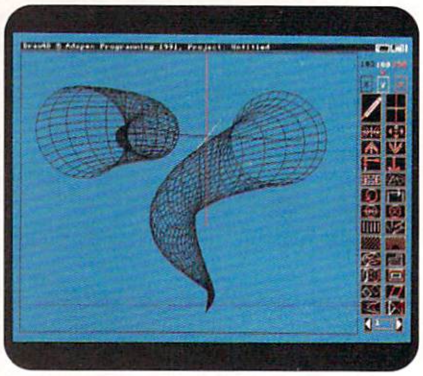
Foremost Functions

Topping off the list of functions is an extremely powerful rounding function that you can use to remove any semblance of planar faces, even if they are not subdivided.

I found sweeping and extruding a great way to build objects from single polygons, and an amazingly simple way to bridge the gap from rigid geometry to fluid, biomorphic forms. Both methods can employ up to 16 radius combinations in a single polygon to generate a myriad of unique shapes. To create sweeps, you rotate a polygon around an axis for a predefined distance and number of segments. Some interesting side effects occur when you add an offset value for axes other than the one containing the template polygon. The same is true for any adjustments made in the ending size of the template.

For example, try setting your viewpoint to look down the Y axis toward the origin. Create a circular polygon of N sides and radius R, at a distance D from the origin in the XZ plane. Then sweep the polygon 360 degrees around the Z axis in S segments. If the ending size is set at 100%, the resulting figure is a torus, but if the ending value is less, 4D-Pro automatically resizes each of the segments as it rotates through the 360 degrees, producing a spiraling effect around the center.

If you repeat the first and second steps, adding an offset value to the Z axis, the figure spirals around Z along the direction of the offset. The resulting figure is like a coiled spring.



In Draw4D-Pro's editor mode, wireframe models speed up the display.

You can apply a similar scaling technique to extrusions, tremendously increasing the number of possible shapes that can be created that way. A special variation called Pipe Extrusion lets you use one polygon as a cross-section template and another as a shape for the extrusion to follow. For instance, the outline shape of a polygon used for an alphabet character can become the extrusion path for a second polygon, used as the cross-section template. The result: a raised, outline letter.

Draw Me A Map

The most complicated aspect of Draw4D-Pro is its capacity for precision texture mapping. You can use any standard IFF-bitmap image as a texture and apply it to a single polygon, a group of polygons, or a whole object by projecting, wrapping, or tiling along any one of the primary axes.

Using a requester attached to the Load/Alter Textures menu, you can set or change attributes such as the strength and color density of the texture; its application method (tiling, wrapping or projecting); its special "genlock" setting (no hardware genlock required) that you can assign to make color 0 transparent; or decal function (similar to the genlock function). Once you map an image onto a surface, it becomes an integral part of the form. Thus, reshaping, rescaling, or otherwise changing the surface adjusts the appearance of the texture. When you combine textures with transparency, you can overlay them. By adding either Gouraud or Phong shading, you can achieve some pretty stunning results.

Because Draw4D-Pro stores import-

ed textures in RAM, memory seems to be the only limiting factor. The program maintains textures in a list and then saves the pathnames from which they were loaded with their corresponding objects.

The animation functions allow you to perform hierarchical, object deforming/morphing (shape changing), and complex pathway maneuvers whereby polygons define paths. To accomplish deforming, you select an object and establish it as the beginning shape. Then, you alter it with the tools provided and designate the result as the end shape. The program then automatically adjusts each frame, from beginning to end.

You can perform this type of transition in segments for more control, defining every aspect of movement and speed in the Preview mode before the program compiles the animation. The program treats pathways as standard polygons and links them together to produce more complex movement. I discovered that the Elapsed Time Remaining (ETR) counter was quite helpful. It keeps track, frame by frame, of the length of time it takes to assemble animations.

The Tortoise Factor

Please don't misunderstand my apparent enthusiasm. For all its terrific features, there is a down side. Like other draw packages, Draw4D-Pro is not fast! With conventional paint programs, the number of bitplanes and colors determines speed of execution; not so with Draw4D-Pro, which requires approximately the same amount of time to complete whether the image is HAM or 32 color. Even at 50 MHz, it drags its feet when the scene becomes complicated. At normal 7.14-MHz speeds, relatively simple images can be frustratingly slow to complete in the display mode.

To put the speed question into perspective, a 120-frame HAM animation using a single, nontextured, Phong-shaded rotating object and a sequence of morphing took 91 minutes to complete. On a standard Amiga, the ETR counter reported that the same animation would take 43.5 hours! Let's face it—constructive solid geometry requires a lot of calculating, and that's where 4D-Pro spends its time and effort.

This is not to say that the folks at Adspec aren't aware of and sensitive to the problem. In fact, the manual includes a number of hints and tips on ways to help speed things up, and there is a Quick Display mode for the Editor.

If you do not have a hard drive, you will need to be somewhat careful when saving drawings (collections of objects). 4D-Pro files tend to hog disk space. An image with roughly 5000 polygons can be about 500K.

Unlike some programs, you cannot ignore 4D-Pro's documentation without missing a lot. Which brings me to my only real complaint. Quality of presentation is as important as quantity of information, and although the text is well written, it is so dense that it is difficult to follow. I spent as much time finding my place as learning how the tools worked.

If you are not racing the clock and want professional quality software, flexible tools, and virtual freedom to control the destiny of the image-making process, give this program a serious look. ►

KB-Talker

Co-Tronics

AT speak.

By Greg Morris

DO YOU DISLIKE the feel of the Amiga's keyboard? Are you more comfortable with the layout and feel of an IBM AT keyboard? Do you use a Bridgeboard? If you answered yes to any of these questions, the KB-Talker ($59.95), a hardware device that allows you to attach an IBM AT-compatible keyboard to your Amiga, just might be the product for you.

Many people have a particular preference when it comes to how a keyboard should feel. Some prefer keyboards that produce a definite "click," while others prefer those that respond to a softer touch. Now, with the introduction of the KB-Talker hardware module, you can plug almost any IBM AT-compatible keyboard into your A1000 or A2000. (A special version is planned for the A500. Although it will involve a more difficult installation procedure, you gain the advantage of having a detachable keyboard.)

The KB-Talker hardware module plugs into your Amiga's existing keyboard connector, and then you plug your IBM AT keyboard into the other side of the module—an extremely easy procedure. KB-Talker accomplishes its tasks without using any disk-based software of its own or any software modifications. As a result, its operations are transparent to application software. There is a single circuit board inside the module, which is a metal box approximately 4×2.5×1.5-inches in size. The connections on the circuit board are clean, and the module is solidly constructed.

You have a couple of options when using an IBM AT keyboard. By pressing the "Pause" key, you can toggle between IBM and Amiga keyboard layouts. In IBM mode, most keys function as they appear on the IBM AT keyboard, with the addition of moving the left and right "Amiga" keys to F11 and F12. In Amiga mode, the layout is modified to more closely match that of the original Amiga keyboard. Because of the dual nature of some of the keys, KB-Talker includes self-sticking labels with dual legends that you place on top of particular keycaps to show each one's intended purpose according to the mode currently active.

The six-page manual describes installation and use of the product in a reasonable manner. It also includes drawings of the functions of each key for both IBM and Amiga modes.

In using KB-Talker, I found that everything functioned as intended, with some adjustment required to get accustomed to changes in the location of particular keys. To avoid becoming confused about which key to press, I found it is better to remain in one mode rather than toggle frequently between the two.

As stated in the manual, some keyboards that are made for complete IBM-compatible systems may not work if they use their own standards. While a Tandy keyboard that I tested with the KB-Talker worked flawlessly, one from a different IBM-compatible system worked only partially, with certain keys not behaving properly. Make sure the keyboard you intend to use is indeed fully IBM AT-compatible.

Those of you who like the idea of the added flexibility of choosing almost any IBM AT-compatible keyboard definitely should consider KB-Talker. It does the job it was intended to accomplish, is easy to install, and is completely transparent to existing software.

SpectraColor

Oxxi/BazboSoft

A visit from an old friend.

By Steve Pietrowicz

ALTHOUGH SPECTRACOLOR IS a relatively new name on the lips of Amiga artists, the program is essentially an upgrade. Remember Photon Paint 2.0 from MicroIllusions, the HAM paint program that supported animations? Although it's been a couple of years since we've seen a revision, SpectraColor is the answer for all those Photon Paint users who thought another upgrade would never see the light of day.

If you're familiar with Photon Paint, you'll have no problem learning to use SpectraColor ($99.95). Oxxi has reorganized some features such as the Paint Toolkit and the color-palette selection area. You will also find brush manipulation, fills, foreground and background effects, and a considerable number of other features from the original program. (For a review of Photon Paint 2.0, see *AmigaWorld*, Sept. '89, p. 78.)

While Photon Paint 2.0 did provide animation capabilities, SpectraColor's new Animation Toolkit makes it easier to control and build animations. With the progam's new VCR-like control gadgets, you can play, fast-forward, rewind and single-step your animations. If you've got a large animation, these controls can make it easier to find and work with individual frames.

To help you save time and effort while constructing an animation, SpectraColor now supports "tweening." Suppose you have an object that you want to move across the screen in twenty frames. Instead of manually drawing each object in each frame, SpectraColor lets you specify the starting and ending positions, and the program will automatically draw all the positions in between. The path the object takes can fall anywhere between a straight line and a complexly drawn path.

Keyboard equivalents also let you move between frames within animations. While moving back and forth between frames, I found that the program sometimes became confused and didn't move to the next frame as expected, but stayed put. After I repeatedly pressed the same key, the problem corrected itself and then proceeded to the next frame.

On the Move

Animbrushes constitute another new feature of SpectraColor. If you've ever used DeluxePaint III, you'll have no problem using the animbrushes in SpectraColor. They operate in much the same way: You simply draw a series of pictures on separate screens, and by outlining an area, you can turn the pictures therein into an animbrush. You can then use these to easily create more complicated effects by combining them with animation paths. For example, if you've created an animbrush of a man walking in place, by attaching it to the animation paths described earlier, you can make him walk across the screen.

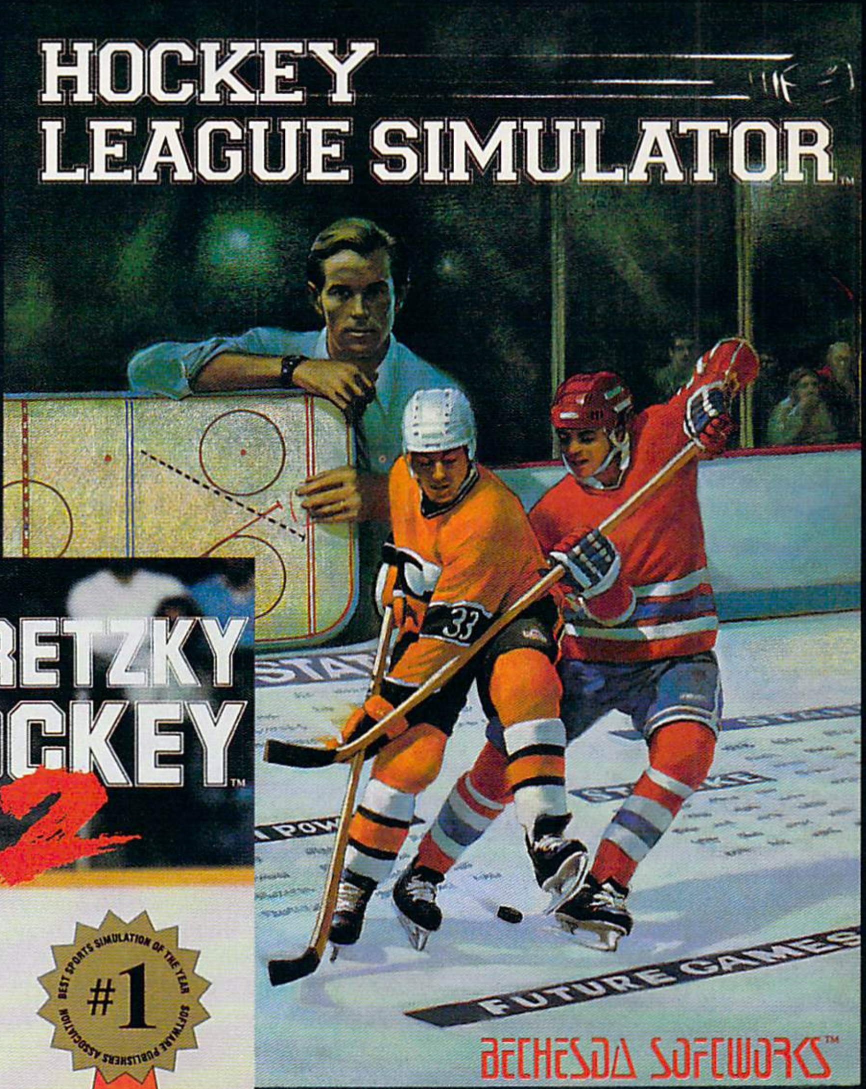
One of Photon Paint's highly touted features was its brush-wrapping capabilities. This feature now applies to animation, as well. Now you can tween brushes from one wrap size to another. For example, you can take a brush and wrap it on a sphere, and after drawing the sizes you want for the first and last frames, SpectraColor will automatically draw all of the wraps in the frames between. However, the program will not allow you to change from one wrap method to another (e.g., from a sphere to a tube).

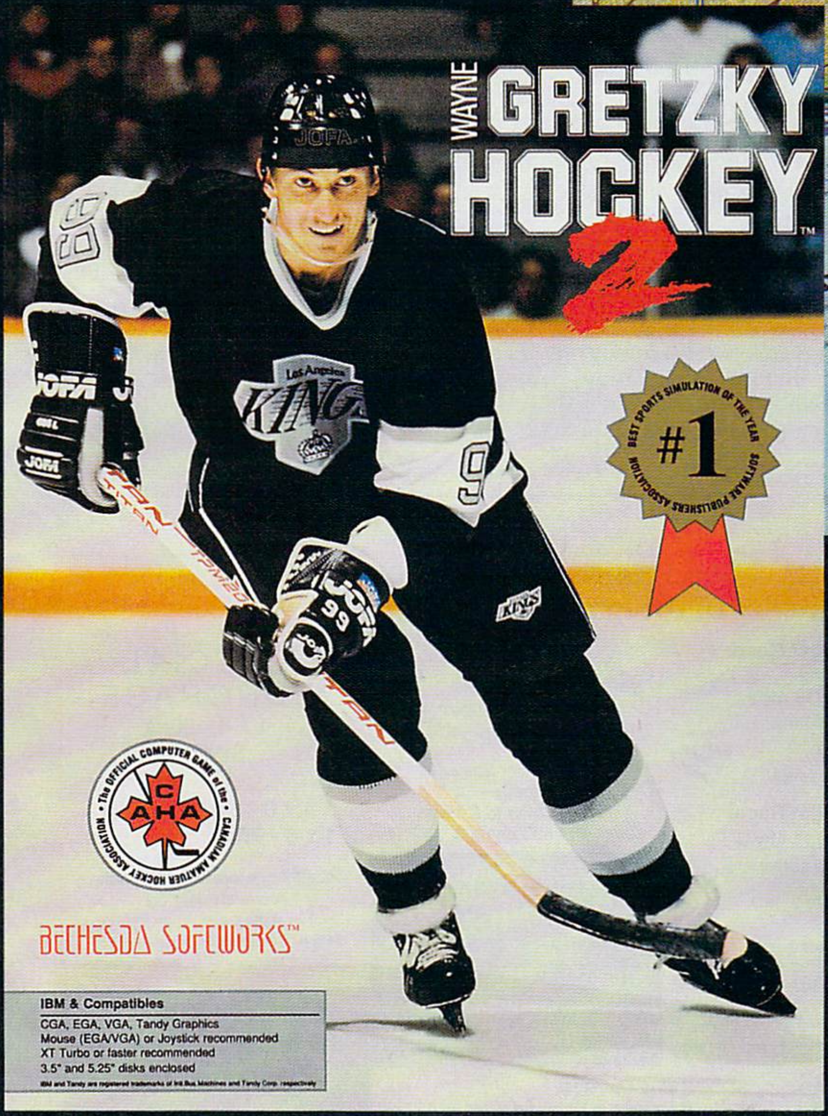
SpectraColor's manual is quite large, ►

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larger even than that of Photon Paint 2.0. The first sections offer brief tutorials for each tool or feature. These sections answered most of my questions. More detailed information is available in the later sections if you find a feature confusing. The appendices contain miscellaneous information such as installation procedures and technical information. An included quick-reference sheet provides help for remembering the many keyboard equivalents. Overall, the manual is very thorough, although many of the screenshots included are either too small or too out of focus to be useful.

It's good to see that the developers at BazboSoft are continuing their work with SpectraColor. In fact, there is already a version that supports Black Belt System's HAM-E device. The program certainly has a lot of potential, but there are still some areas that need work.



With SpectraColor, you can "paint" one color over another.

Acceleration would greatly enhance SpectraColor. For example, I drew a white circle about the size of a quarter on a black screen and used the fill operation to change the background to a solid blue. That simple fill took more than twenty seconds. A quick check against Photon Paint 2.0 revealed that it behaved the same way.

There were some serious bugs in earlier versions of the program, so if you own one of those, you should contact Oxxi about an upgrade. The latest version is 3.2.

You should also know that Oxxi has a 900 number for technical support. It costs one dollar for the first minute and two dollars for each additional minute. The policy has been in effect for quite a while, and as of this writing is still in place.

If you are fond of Photon Paint and like the sound of SpectraColor's new animation capabilities, then take a careful look at this program.



BACKTALK

CANDID RESPONSES TO *AMIGAWORLD* REVIEWS

Regarding Bill Frazier's review of Protext (see Oct. '91, p.106), I'd agree that the program does not have an Amiga look and feel to it, but vertical and horizontal slider bars really aren't missed that much. The program does have pull-down menus, although most users would want to use keyboard shortcuts. It doesn't include graphics—a point worth making, even though Protext is not a desktop-publishing program.

It is worth mentioning that European accents and many characters are available—provided your printer supports them.

Protext seems to rely entirely on the printer's own fonts, which means that ouput on an old Epson FX-80 is similar to that created on any computer, and this is the biggest frustration that I have with the program.

From his final comments regarding the lack of a thesaurus, I assume that Bill reviewed version 5.0. Version 5.5, with a thesaurus of 43,000 main entries, has been advertised in the UK Amiga press since late summer.

Peter Wesson
Opington, Kent, England ■

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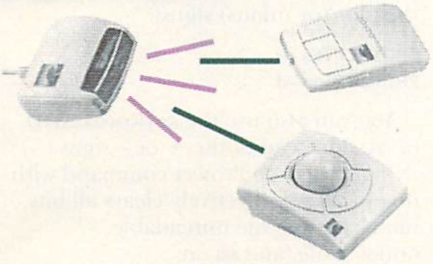
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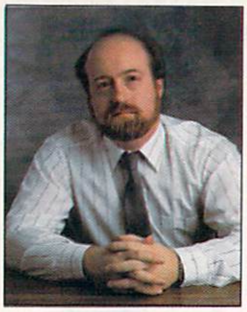
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HELP KEY

Lou clears up a problem of too little RAM and offers a bit of advice on deleting read protection.

By Louis R. Wallace

MORE RAM ON COMMAND

Q: *I have an A500 with a megabyte of RAM and am having trouble with Amiga Basic. The program I am writing is getting an "Out of Memory" error message, and no matter what I do, I can't get any further. I know Amiga Basic has a set limit of 25K, and so far my program is 24,666 bytes. Someone suggested I use the Clear command to increase the size of memory available, but I can't get it to work. Could you explain how to increase memory with the Clear command? Also, someone else told me to try the Chain command. How would that help?*

J. Jackovich
Arlington, VA

A: Amiga Basic sets up the default size of memory available for its programs to 25K, but this can be increased or decreased by using the Clear command, the syntax of which is:

```
CLEAR [,data-segment-size][,stack-size]
```

To simply increase the size of memory available for your program, add the Clear command as the first statement in your program. For example, to increase the RAM available to basic programs from 25,000 to 50,000 bytes, add the following:

```
CLEAR 50000
```

This increases the data segment size to 50,000 bytes of RAM that you can use for the program and variables.

If you have a large program that uses a lot of ROM and/or library routines, or that has a lot of complex structures that use GOSUB, FOR...NEXT, WHILE...WEND, or user-defined functions, you might need to increase the stack size with the second (and optional) parameter of the Clear command. This value must be at least 1024.

The Chain command allows a Basic program to execute another Basic program during the first program's execution. A good example of this would be when you want to use the Clear command to specify some amount of RAM for use by a second program. In this case, the first program would consist of a Clear command (and the required parameters), with the Chain command on the next line indicating the name of the program to load and run.

The Chain command has a variety of options that you can invoke. For example, you can pass variables from the first program to the second, merge a second program (as an ASCII file) into the first, and even begin executing the second program at a point specified by a line number.

The advantage of using the Chain command is most evident with systems that have limited memory resources. In such a case, you can often break down a large program into several smaller ones that you can Chain together, using the disk storage as virtual memory and effectively creating a program that is bigger then your RAM resources would normally allow.

READ-PROTECTION PUZZLE

Q: *Every now and then I come across a file that I cannot delete because the "File is Protected From Reading." (I am using a PD disk utility that displays this message.) I try to rewrite the protection bits, but I keep getting the same message. Does this mean that once a file has been read protected, it cannot be changed or deleted?*

J. Maciorowski
Port Richey, FL

A: No. All read protection does is prevent the file from being read by a command like More or Type. You can still delete it, and, more importantly, you can still change its protection bits. You should be able to change them with your disk utility, unless it has a bug in it or you are doing something wrong. But the easiest method to change protection in your case might well be to just do it directly from the command line (SHELL or CLI).

The syntax of the AmigaDOS PROTECT command is:

```
PROTECT filename protect_bits
```

The filename is the file you want to alter, and the protect bits are the protection bits you want to alter. For example, if you had a file named foo and wanted to make it readable, writable, executable and deletable, you would use the following command line:

```
PROTECT foo rwed
```

If you just wish to change the read bit and not alter any other bits, you can selectively set (or clear) bits by using the plus (or minus) signs:

```
PROTECT foo +r
PROTECT foo –d
```

You can also use the keywords ADD or SUB instead of the + or – signs.

If you use the Protect command with no options, it effectively clears all bits, rendering the file unreadable, undeletable, and so on:

```
PROTECT foo
```

To see what the current protection bits of a file are, you can use the List command. Among the items of information it shows is the status of the protection bits. For example, if you were to type LIST foo, you might see something like this:

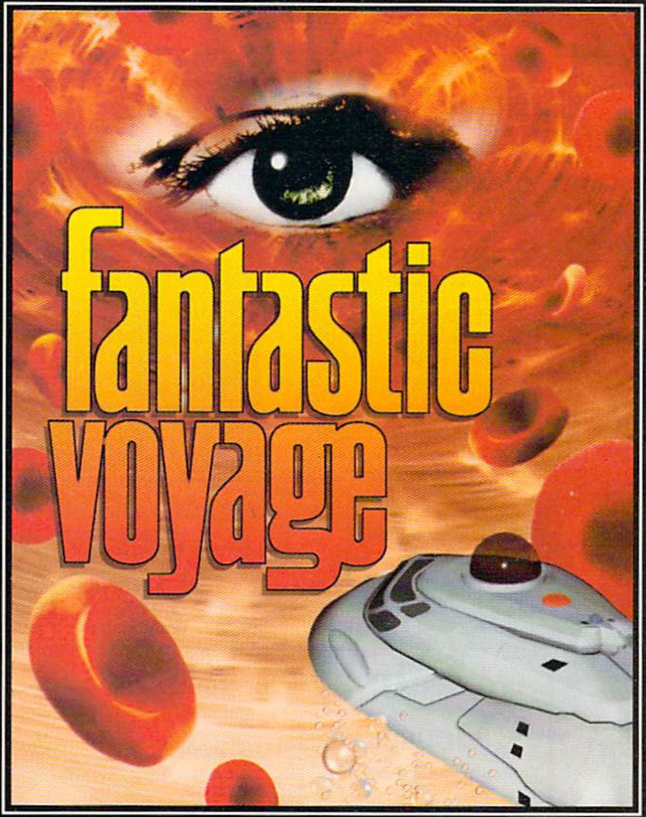
```
foo        1024  ----rw–d Today   16:09:35
```

This shows the filename, its size in bytes, and the protection bits at the time (––––rw–d), as well as the date and time it was written.

So far, there are seven protection bits you can use in AmigaDOS. These are r (read), w (write), e (execute), d (delete), s (script), p (pure), and a (archive).

Incidentally, the Protect command under AmigaDOS 2.0 now includes pattern matching, which allows you to perform protection-bit changes on multiple files. ■

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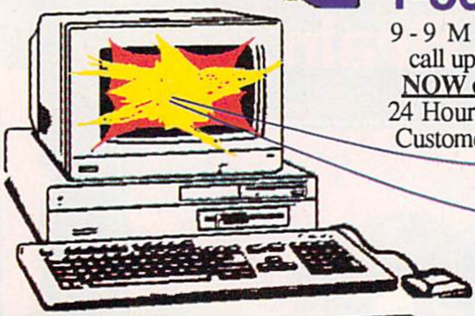
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- Cross-Platform Compatibility
- Games
- Graphics/Animation
- Hardware: Systems/Expansion/Peripherals
- Multimedia/Authoring Systems
- Music/Sound
- Operating System/Workbench
- Printers/Printing
- Productivity/Business
- Profiles
- Programming
- Telecommunications/Networking
- Video

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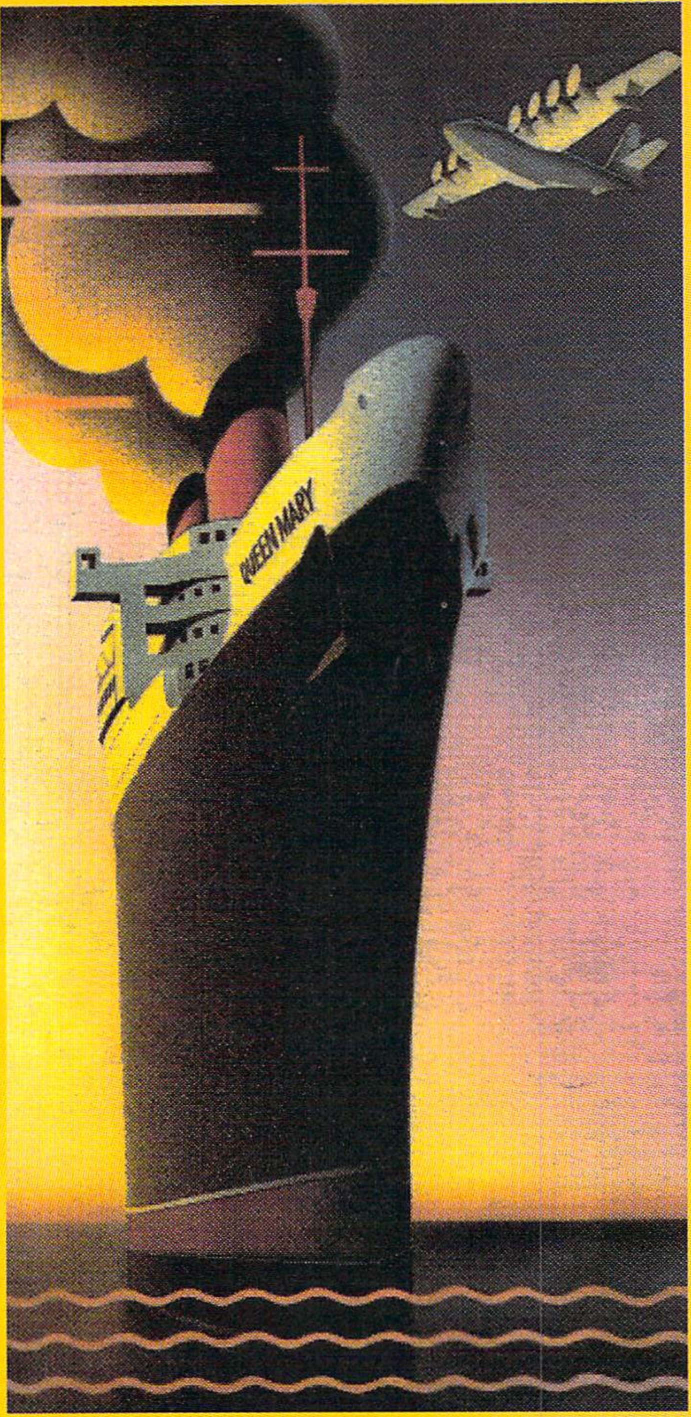
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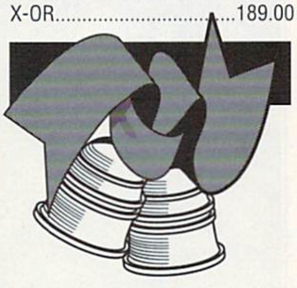
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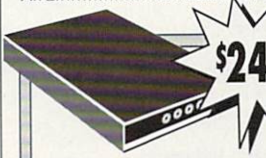
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FD62: PomPom Gunner. An extremely smooth and well done World War II gunner simulation. Requires 1 megabyte of memory.
WB104: GrabBag - Q&A Trivia (requires AmigaVision) is a trivia game for 1/2 players...add your own questions to customize the difficulty level! Sysinfo is great for telling you how fast/slow your computer is, what boards are installed, chipsets, etc. AmiGazer will plot stars in the heaven from any position on earth complete with magnitudes and constellation identification.
WB103: Music - Contains 12 "great" Soundtracker/MED music MODules...complete with programmable/shuffle player...8 bit audio never sounded so hot! Two disk set counts as two.
WB102: Communications - Contains the tour-de-force programs NComm 1.921 and VT100-29B. Automatic Zmodem protocols, XPR protocol support, full VT100 emulation. NComm's script language is so powerful it comes with a script file that creates a full-featured BBS system.
WB101: Chemesthetics - is a program that displays molecules as a calotte model. This kind of display contains a certain esthetic attitude, even extremely poisonous molecules like nicotine and dioxine look quite nice.
WB100: CaligariPRODemo - Can't afford $3,000+ to see if the granddaddy of 3D rendering software is for you? Then try the demo version of this renowned modeler that the pro's rely on! No built-in save function, requires 68020+ processor.
WB99: Lifestyles - Includes AGene--family tree program that tracks up to 600 people/marriages/etc, Landscape is a backyard CAD program to create gardens/landscapes, Loom simulates an 8 harness loom; experiment with pattern design in an instant feedback environment.
WB98: Business - Includes BBaseII a nice, powerful database; BizCalc--a personal or mortgage loan calculator with amortization capabilities, Loop--a flowchart maker, Formmaker - design professional looking forms on your Epson LQ-2500 compatible printer.
WB96: Dupers - Contains XcopyIII & Nib which will backup copy-protected programs. FreeCopy removes copy protection from several programs, and SuperDuper will crank-out fast AmigaDOS copies.
WB95: Checkbook Accountant 2.1 This program is definitely commercial grade; we've seen many checkbook programs and this is absolutely the best. Full budgeting, transaction recording and report generation.
WB93: Workbench Extras #2 This disk contains the utilities that Commodore should have shipped with the Amiga; VirusX4.0, Snap, FixDisk (recover corrupt/deleted files), Disk Optimizer (floppy & hard), MachIII (screen blanker, hotkey, mouse accel., macro, clock utility), GOMF (a gurubuster)and PrintStudio.
DD82: Unix - Contains a working demo of Minix - a Unix workalike. Minix is system call compatable with V7 of Unix, supports multitasking and multiple users and many more features too numerous to list here.
DD81: ARexx Tutorial - Includes several sample Arexx scripts and sample programs. Also includes APig; a library that gives you access to Intuition from within Arexx scripts.
DD80: VFont System - A font rendering system that extends the Amiga so that it will be able to use vectorized outline fonts. Fast rendering, rotating, and sizing. Use in your own programs!

Other Great Disks!

FD5: Tactical Games - BullRun - a Civil war battle game, Metro you play the role of a city planner. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Very very habit forming.
FD6: GAMES! - This disk is chock full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.
FD7: PACMAN - This disk contains several pacman type games including; PacMan87, MazMan and Zonix.
FD9: Moria -. This has great graphic controls, multiple spells, similar to Larn and Hack. Play time several weeks!
FD10: HackLite - A dungeon adventure game. Considered a must-have classic. This is the second release of this game on the Amiga. Great graphic interface. Play time several weeks!
FD11: Las Vegas and Card Games - Las Vegas Craps - The best Las Vegas Craps simulation every written for any computer. Contains extensive HELP features, Also Thirty-One,VideoPoker and more.
FD12A,FD12B: Star Trek, The Game - This is by far the best Star Trek game ever written for any computer. It features mouse control, good graphics, digitized sound effects and great gameplay. Counts as 2 disks. Req. 1Mb and two drives (or hd).
FD13: Board Games - contains multiplayer Monopoly, Dominoes, Paranoids, and others.
FD14: Dungeon Master Hints and Arcade Games - DM maps, spells, item location, and hints and more, also on this disk, Hball - an arkanoid/breakout type game, Trix - a Qix type clone.
FD17: Educational Games - This disk includes several games for the younger members including geography, math, science, and word games, also includes Wheel of Fortune.
FD20: Tactical Games - MechForce(3.72); A game that simulates combat between two or more giant, robot-like machines. Simple words can't begin to give you the feel of piloting a 30 - 40 foot tall, fire breathing, earth shaking colossus that obeys your every whim.
FD26:Arcade Games - Marble_slide, this is a truly commercial quality game. Similar to a Lucas game named PipeDreams, excellent playability and entertainment, Mutants , a small version of the arcade game of the same name, also SuperBreakout a pong/arkanoids type game.
FD27: Arcade Games - This disk is loaded with some great games. Includes, Raceorama a great racing car game with ten different courses, MiniBlast a helicopter gunship type clone, Shark in the same class as froger, and SBreakout the original breakout with more.
FD29: Shoot'em up's - WWII - you're the pilot of a WWII plane flying through enemy territory, you've just been spotted, good luck on you mission, SpKiller - try and penetrate enemy lines with this game, and Retaliator - another great game.
FD31: Games! - Air Traffic Control - a good ATC simulation game, Black Jack Lab - a full featured set of card games, ChessTel - play chess with your friend in distant and remote places with this game and a modem, labyrnth - a well done text adventure game (like an infocom game), and MouseTrap - a 3d maze game.
FD32:Flight Simulator - Includes an instrument flight simulator for a DC10.
FD33: Arcade Games - Ffreddy a mario brothers type of game, Gerbils a target practice game, PipeLine a German interpretation of Pipe Dreams, Tron a light cycles version, and wetroids a wonderful version of asteroids with a hilarious twist.
FD35 Omega (v 1.3) - A new outstanding dungeon and outdoors adventure game in a similar vein as hack, rouge, and moria. This version is considerably faster and better that all previous versions. Play time several weeks or months.
FD37a & b:Tactical Games - Empire (2.2w) This great game comes highly recommended. With a full-graphic front end.
FD38:Games - Cribbage Master - A great cribbage game and tutor, Spades - a well done card came, ChineseCheckers - A computer version of this classic, Puzz - a slide piece puzzle game and construction set.
FD39a & b: Star Trek, The New Generation - This is a, completely different version of Star Trek than that found on FD12. This one was created by the German author Tobias. Now with English instructions. Excellent!!! Counts as two disks. Requires 512k memory.
FD44: Game - Mechfight is an out of this world role-playing adventure comparable to hack and moria. The setting, interplanetary colonies and space stations. In your quest to explore the world, take time out to liberate bad guys of their most valuable possessions, engage in a mortal combat or two against robots and alien life forms, pick up a new amiga 9000. Most of all, don't forget to stay alive...
FD49:Chaos Cheats - This disk contains an everything you wanted to know about cheat set for Chaos Strikes Back, including full maps, spells, object locations, super characters and more.
FD50: Submarine Game - Sealance, one and a half years in the making, this is an outstanding submarine tactical game. Commercial quality, highly recommended.
FD52: Classics Games - PetersQuest a well done Mario brothers type of game, Jymbc a two player missile command clone, and Vstank a tank commander game.
FD53: Great Arcade - On this disk is a wonderful implementation of the ever popular classic arcade game Defender. Also contain Air Race a WWII flying ace arcade game, and Psycoblast new creation idea game.
FD56: Arcade - Includes SpaceWar, HueyRaid a well done helicopter arcade game, and PowerPong a great expanded pong game.
FD57: Arcade Games - Includes 2 true commercial quality games. MegaBall is the successor to Ball; features 5 full musical scores, multiple levels and addicting gameplay. Gravity Attack is a psychadellic trip through several different worlds--each distinctly different.
FD58: GAMES! - Includes Steinschlag; a great Tetris clone from Germany with music. SCombat: simulate battle between up to 40 players & monsters. Imperium Romanum: Battle up to 4 players for control of the Mediterranean in this Risk-esque game.
FD59: Game Potpourri - Xenon III is an almost exact clone of the commercial game of the same name...a great shootemup. Crossword will take lists of words & automatically generate word-search puzzles for any Epson compatable printer.
FD60: Games - In Nebula, race over a 3d world to destroy enemy installations. Interferon; a great Dr. Mario clone. Enigma; is it a gameor a puzzle?
FD61: Games - Solitaire; great graphics, plays two versions. Klide; an interesting piece of eye candy. Extreme Violence; 2 player kill or bekilled game. YATC; A Tetris clone with Artifical Intelligence. Genesis; create realistic 3d fractal worlds.
WB4:Telecommumnication - This disk contains several excellent pd communication programs designed to get you on line quickly and easily, Access (1.42) - A very nice ANSI term program based on Comm v1.34, but with the addition of transfer protocols, Comm (1.34) - Last version of one of the best public domain communications programs ever made on the Amiga, Handshake (2.12a) Handshake is a Full featured VT52/100/102/220
WB5 - Fonts #1- Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.
WB6: Video Fonts #2 - ShowFont(4.0) This program allows you to quickly and painlessly view all 256 characters in a typical font. Large AmigaDos system fonts (many up to 56pts).
WB7: Clip Art - This disk is loaded with black and white clip art. Art includes, trees, watches, tools, US and State maps, and more.
WB9:Icons - Truly a multitude of various types and kinds. Also includes IconMiester, IconLab, and others great utilities to help generate icons.
WB10:Virus Killers - The latest and best VirusX(4.0), Kv(2.1), and ZeroVirus III.
WB11: Business - Clerk(4.0), finally a full featured business accounting PD program for the small to medium company. Includes receivables, payables, end of month and uch more.
WB12: Disk Utilities - This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery archive and organizing, and all sorts of file manipulation. A must have!
WB13: Printer Drivers and Generator - over 70 different drivers, and if these don't do it, with PrtDrvGen you can make your own.
WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).
WB16: Business - This disk contains an inventory manager, a loan analysis program, a great calendar/scheduler, a rolodex program, and pennywise a good "Cash Book" accounting for home or office.
WB18: Word/Text Processors - This disk contains the best editors. Includes,TextPlus (v2.2e) a full featured word processor, Dme(v1.35) a great programmers editor with strong macro features,TexED(v2.8) an enhanced Emacs type editor, and a spell checker.
WB20: General Interest - DiskSalv V1.42 a disk recovery program for all Amiga file systems, FixDisk V1.0 another file recovery program with features DiskSalv doesn't have, 3DLook gives a 3D appearance to your WorkBench, Clean V1.01 a program to de-fragment memory, Tracer - trace any part of an image.
WB22: Fonts #3 - Several more great fonts. These, like the other font disks work great with Dpaint and WYSIWYG word processors.
WB23: Graphics and Plotting - Plot (20b) a three dimensional mathematical function plotter. Can plot any user defined function, BezSurf2 - produce awesome pictures of objects one could turn on a lathe. Can also map iff image files onto any surface that it can draw. Now compatible with most 3D packages, and VScreen - makes a virtual screen anywhere, great for DTP .
WB25:Educational - On this disk are two programs that can generate maps of differing types, World Data Base uses the CIA's data base to generate detailed maps of any entered user global coordinates. Also Paradox a great demonstration of Albert Einstein General Theory of Relativity.
WB26: Disk Utilities #2 - MrBackup, KwickBackup - two well done utilities to help with harddisk and floppy disk backups, FileMast - a binary file editor, Labelprinter - Disk label printer with very powerful features.
WB27: Nagel - 26 Patrick Nagel pictures of beautiful women.
WB29: Graphics and Sound - This disk has several different Mandelbrot type programs for generating stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generated recursive fractals from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date, will display ALL IFF's including Dynamic HAM, and Sound - a great IFF sound player, will play anything. Try this disk!
WB33:Circuit Board Design - several terrific routines for the electronic enthusiast, Including PCBtool - a circuit board design tool, LogicLab - circuit logic tester, and Mcad (1.26) a well done new release of this PD CAD program, now comes with predrawn common circuit components for insertion into schematics.
WB34: Utilities - Several well done utilities, some will require moderate knowledge of a CLI or Shell for setup, Chatter Box - this one will play any user defined sound after any event (ie. disk insert, mouse click, disk removal...), , Artm - The Amiga real time monitor, gives you full control of the Amiga OS, very powerful program,

Helper - help program to make learning the CLI easier, and more!
WB35: 3d Graphics - This disk contains several neat programs to use with your 3d modeling/raytracing programs 3dFonts - Full vector font set for use with 3d programs, FontMaker - make 3d fonts from any system font, Make3DShape - create 3d shapes from any image, DumptoIFF - create 3d animations preserves pallet, and World3d - a demo program of a front end for use with DKBRender.
WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphic models with this one!
WB35: 3d Graphics Cont.- World3d - a demo program of a front end for use with DKBRender.
WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphic models with this one!
WB37: Educational - Educational games and puzzles that cover math, geography, spelling, and books. Ages 6 - 15
WB38: Plotting and Graphics - Plotxy is the most powerful full featured plotting package. Used by many colleges and universities. A welcome addition to our library! Highly recommended. Plans - a incredibly well done Computer Aided Drafting program, very full featured. Tesselator - a program that helps generates fantastic looking, recursive M.C. Ecsher type pictures.
WB39: Music - Intuitracker is a German offering of an exquisitely well done program that allows you to play music on your Amiga with CD like controls. Lets you strip out music from your favorite games or others and include them in your music library.
WB40: Music - "CD on a disk", 90 minutes of modern music on this well presented collection. Requires 2 drives or HD.
WB41: Music - MED an incredibly well done, full featured music editor. Create your own stunning music directly on your the Amiga. Similar to SoundTracker but better. Very powerful easy to use program. Ver. 3.10.
WB43:Business - This disk contains AnalytiCalc - probably the most powerful spreadsheet program on the Amiga. A full featured spreadsheet with many features expected in a commercial package. Requires 1.2 MB of memory!
WB46:Clip Art - HighRes clip art with the following motifs - embellishments (borders, dodads ,...), people, and transportation.
WB48: Clip Art - HighRes clip art with the following motifs - Holidays, music, medical, and misc.
WB49abc:Animation Sampler - On this three disk sampler set (counts as two disks) are some of the best animations that have been created over the last three years. Several examples of "Movie" type animations some with spectacular raytraced reality (coolroby, watch, spigot and egg). Also several european style or "Demo" animation with incredible graphics and outstanding electronic music (akrilight, copersine, doc, dps2010, impact, and logodemo). These truly show off the creative edge of an Amiga!

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WB50: Animation - Seven of the best european style animations or "Demos", including - scientific 451, subway (a U.S. entrant, also our favorite), sunride, thrstdemo, tnight, waves, and woow.
WB53:Graphics - Raytracing programs generate absolutely stunning realistic looking planes, rockets, buildings..., and surreal images often consisting of highly polished spheres and objects. C-Light is the most powerful EASY-TO-USE of it's kind we have seen to date. This is easily better, and more full featured, than similar commercial programs costing in the hundreds of dollars. Also, sMovie - a full featured video text titler similar to ProVideo, Broadcast Titler. Great video scrolling, wipes, special effects, and more...
WB54:Printing - This disk contains several routines to help with the chore of printing. Includes Gothic - Finally a Banner printer for the PD! PrintStudio -a well implemented all-purpose printer-utility with a very comfortable graphic interface and many advanced features, Lila - with ease, print ASCII files to a PostScript printer, and many more.
WB55:Application - XCopyIII - a full featured disk copier, make backups of write protected disks. RoadRoute - find the quickest route from one city to another, highway description included, Diary - a diary program like "Dougy Howard M.D", Cal - a calendar program, Magman - a database tailored to maintain records on articles and publications.
WB57:Animation - This disk has several "Demo" style animations, Including, Blitter, Lolly, Sun5, vertigo, vortex, and xenmorph.
WB59:Business - contains a great, very full featured stock market technical analysis and tracking program, also an appointment calendar, and more.
WB61:Intermediate Utilities - Includes programs to help to drasticaly decrease flicker in interlace and hi-res modes (antiflick), an Atari-st emulator, an eprom programmer, turn your amiga into an eight channel digital data analyzer or ocilloscope, and more.
WB62:Midi Utilities - Several useful midi utilities including, programs to transfer to and from several music programs to midi, a midi sysex handler, a midi recorder with timebase, display midi info, file sequence player, and a few scores.
WB63:Disk Utilities #3 - Several highly recommended programs to aid in removing duplicate files from your hard drive, performing file backups, Binary editing, fast formatting, file recovery, disk track recovery, and forced DISK VALIDATION of corrupt disks.
WB66:Icons #2- Lot's of neat icons. Also, several wonderful programs that to let you create your own icons, modify and manipulate icons and info structures.
WB68:Music Utilities - several good utilities for the Amiga music enthusiast. Includes, Noisetracker - a great music creation program, Sonix2MOD - converts sonix to .mod files which then can be used by noisetracker, soundtraker, and MED, SpeakerSim - a speaker design tool demo, Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls.
WB69: Music - This disk has over 90 minutes of classical and modern electronic music for you Amiga.
WB70:Desk Top Pub - Atcp - transfer Macintosh screen fonts, Mac or IBM format .AFM metric files, to Amiga screen fonts and PPage .metric files. With this program open door to the libraries of Adobe and PostScript type!, Calendar - month templates in PS form, Post - a full featured post script file display and print utility.
WB75: Music - over 100 instruments files (.inst) and sample sound files (.ss) for your music programs.
WB76: Applications - This disk contains Stichery - a often requested knitting design program, Lotto - a rather complete lottery tracking and prediction utility, SSS - this screen capture program can grab almost any screen including games, Today - a personal calender, Tarot - fortune teller, and Grammar - grammar checker.
WB78: AV - On this disk are two Amiga Vision programs (bubbler, sync) written by Lou Wallace, chief technical editor of Amiga World. These programs are marvelous examples of how too's with AV.
WB79: Home & Business Accounting - Includes Ckbacct - the most complete checkbook accounting program going, LCDCalc - this well done calculator has a very large display and operates from the keyboard or mouse, Mileage master - monitor your automobile mileage with this mileage log, Grammar - a grammar checker, and Worldtime - find out what time it is in up to 50 global cities.
WB81: Great Applications - DataEasy a very easy to use, database program. Don't let the ease of use fool you, this is a very full featured database program including full printer control for address labels and mail merge applications. Also includes, TypeTut a good typing tutor, RLC a full featured label printer, Banner, a multi-font banner maker, and Budget a home accounting in a program. Highly recommended.

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WB82:Animations - Four full length, well done "movie" style animations. Including, Coyote, JugglerII, GhostPool, and Mechanix. Two disk set, counts as one!
WB83: Computer Art - this disk has some of the best Amiga generated computer art that we have collected in the past 5 years.
WB85: Graphics - Contains several programs for manipulating 24 Bit color images (ham-e) and a rather nice Iff Image processing package.
WB86: Amiga Vision - Contains the Centurion Press, An Amiga newspaper by Lou Wallace.
WB88abc: The Complete Bible - A three disk set, with the entire text of the New Testament and Old Testament. Great search utilities. Three disk set, counts as three.
WB90: Rippers, Strippers and Beats - For the Amiga music enthusiast, this disk contains many programs designed strip music from your favorite games and programs. Music can then be played with your favorite Pd Music program. Also contains Drums, a very nice drum machine. This disk can require moderate knowledge of the CLI.
DD45: AREXX Programs - This disk contains several useful arexx programs and examples, PopCLI4 - The latest of a must have utility.
DD47: Pascal - This disk contains everything needed to program in Pascal. Includes, A68k (1.2) 68000 assembler, Blink linking software and PCQ (1.0) a modest Pascal sub-set compiler.
DD49: C Compiler - contains zc(1.01) fully K&R, zcc(1.0) front end, A68k(1.2) assembler, Blink linker.
DD50: ARexx #2 - a must have set of tutorials on ARexx and several useful examples and utilities for ARexx development.
DD51: Circuit Analysis - Aspice (2.3) A full featured program for electric circuit analysis.
DD52: Scientific - Includes Elements - an incredibly well done periodic table program with source, Scientific plotting - over 600k of Lattice C source routines that can be included in your own programs.
DD54: Compression - This disk is loaded with all of the best file compression programs and aids for the Amiga. Many of the programs can be used by the new user. Includes Arc(2.3), Lharc(1.0), Lhwarp(1.03), Pkax(1.0), PowerPacker(2.3a) a must have by all, Zip(1.0), Warp(2.04), and Zoo(2.0). Also IFFcrunch an excellent compression for IFF files.

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WB105A&B: Workbench 2.0 Extras #2
Now that you finally have it, you'll want these utilities that take advantage of the many new features of Workbench 2.0.
Font Editor - Create and edit bitmap fonts and colorfonts.
Screen Blankers - ala fractals and spliners!
Requester Enhancers - no more stale 'please insert volume' requesters--these are animated requesters for all of the system's requesters.
CPUBlit - speeds up text displays for owners of 68020+ CPUs.
Wallpaper - put workbench on top of any IFF picture!
SafeReboot - adds "Shift-Amiga-Amiga" to reboot your computer...flushes all writes before actually resetting the computer...can greatly reduce disk validation errors!
SysInfo - see what's under the hood of your Amiga and see how fast they are.
Icon - Enhances Workbench's "Show All" to display over 40 distinct icons for different types of files (text, graphic, libraries, etc., etc.)
Tool Manager - a ***wonderful*** utility to add tools to your TOOL menu, create a dock to easily launch programs...and much, much more! *A true must have utility!!!*
Public Screen Utils - allow separate programs to share the same screen.
26x0 - Allows owners of Commodores A2620 or A2630 board with old ROMS in their 26x0 board, to use 2.0 without getting the new 26x0 ROMS!!!!!
Two disk set, counts as two disks.

DD55: ARP - On this disk you will find the complete ArpRel3.0 release including the full user docs, the full Developers guide. ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your system easier to use from the CLI.
DD57: Advanced Utilities - Msh - like Cross-dos, copies files to and from MS-DOS, Pal-NTSC - convert any pal program to NTSC and vice versa, Also several utilities that improve your startup-sequence, plus 25 more programs.
DD62: Basic and Xscheme - Cursor - a full featured Amiga Basic compiler, sbasic and ftext - several wonderful routines to help in basic programers, and Xscheme - an interpreted object oriented language.
DD64: Amiga Programmers Manual - The fully comprehensive Amiga programming manual with source code examples and easy to understand tutorials!
DD65: C Tutorials - Several well done tutorials on how to program the Amiga. Includes tutorials and working examples on Device drivers, IFF reads and writes, Sound implementation, Arcade game design and implementation, Double Buffering, and others. A must have for Amiga Programmers.
DD66: Programming ToolBox - Many programs to help in your development efforts (most for C some for basic) Includes programs to generate requesters, an incredible spritemaker toolbox, to greatly aid compiling, convert DPaint brushes to C structures, a great library manager, and many more wonderful time savers!
DD69:Advanced Utilities - SerNet and ParNet - Connect two Amiga's and share resources, MemMonitor - Similar to WFrag but greatly improved, Selector - put menus on your workbench screen, and more.
DD71A&B:C Compiler - This disk contains DICE, Matthew Dillon's full featured, powerful C compiler and environment system. 2 Disks, counts as 2.
DD72: VT Emulators - Contains three powerful full featured VT emulators, with many advanced features including Kermit, Xmodem and Tektronix protocols. VaxTerm, VLT, and more.
DD77: Fortran - Contains a full featured FORTRAN77 environmental development system. Also contains EzAsm a strongly macro dependent 68000 assembler.
DD78: Menus & System Enhancements - Several neat programs to aid in launching programs from special icons (Next computer style), adding WorkBench menus and more. Also contains many useful programs to determine operation system configuration, memory usage, load and many other important utilizations.
D79abcd: Amiga C Tutorial - This is the most comprehensive C language, Amiga orientated set of tutorials available. Includes full working examples, source code and an incredible set of lessons. Included are full discussions and examples of every topic on Amiga programming. Four disk set, counts as three.

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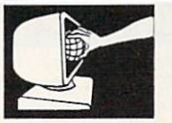
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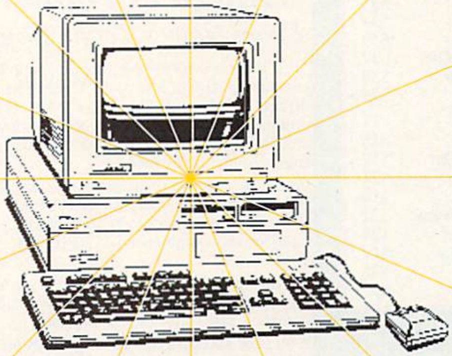
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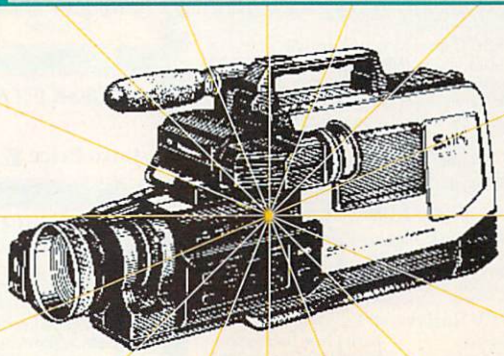
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The Last Word

Kudos, complaints, comments, concerns, and contributions from our readers.

The Tandy Challenge

I noted an article in the Los Angeles Times (Business section, Sept. 27, 1991) in which Tandy Computer claimed it was the first personal computer company to produce a machine that accommodated the industry definition of a "multimedia computer." I thought the Amiga was the premiere multimedia computer, or have I been duped by Commodore propaganda? Neither Commodore nor its major distributors should allow the Tandy claims to go unchallenged. If Commodore is basing the Amiga's future on multimedia, then its capabilities must be touted at every opportunity.

Jeffrey T. Powell
West Covina, Calif.

An Unholy Alliance?

The recently concluded deal between Apple and IBM is sure to hurt Commodore even worse than time alone could do. Amiga needs to standardize high-density drives; it needs 16 million colors (a low-cost, 24-bit display, perhaps an 8-bitplane Agnus?); it needs to replace its 7 MHz chip with a faster processor. Six years have hurt the standard Amiga, for all it has done is stand still. If only Commodore would take charge and incorporate these features into an "awesome computer"—the status that the Amiga once held—perhaps the Amiga would get the recognition it deserves!

Adam Kozak
Brampton, Ont., Canada

A Glower at the "Tower of Power"

I can only shake my head in bewilderment as I read and reread the "Tower of Power" article in your May issue (p. 42), certain that I've missed something. I feel the author, Lou Wallace, did an excellent job of covering the ho-hum announcement of the A3000T, but I am left wanting more from Commodore.

For the well-being of the Amiga community in general and Commodore in particular, the 3000T had better not be the "next wave of A3000 technology." What innovation is involved in adding a larger power supply and a few slots? Is this what Commodore R&D has to show for 12 months of work? Where's the 32-bit custom chip set, the 24- or 16-bit color, or the 32-bit SCSI-2 hard drive interface? Any one of these would be an innovation; all, unfortunately, are missing.

> **The 3000T had better not be the "next wave of A3000 technology."**

Richard Bird
Provo, Utah

Wish You'd Been There

I had a dream vacation last summer—four intense, stimulating and challenging weeks at Humboldt State University in northern California—as a student in a computer animation/music/video workshop. Other classes in Summer Arts '91 included sculpture, painting, dance, film and video, theater and music, all of which contributed to the rich creative environment in which we worked.

The students in the computer program enjoyed a number of guest artists well known in the Amiga community, including Joel Hagen, Gene Brawn, Jim Sachs, and Steve Segal. The four locations—the Mac lab, the Amiga lab, the music building, and the interactive studio—were open around the clock, and everyone took advantage of their availability. With an occasional break for a music, dance, or theater performance, and some irresistible beach time, 12 to 15 hours a day in the lab were the norm.

The boundaries between art and science, math and music, are changed forever with the digital revolution. This is an exciting time for artists, and the Amiga is part of that excitement. We all need to spread the word. Perhaps we, as grass-roots users, can make up for the abysmal marketing efforts of Commodore and influence other creative people to invest in this system.

June Alexis
Upland, Calif.

Upping the Ante

Being a PhD student, I am a bit behind on the doings of various companies and the trends in the Amiga community. Today I found out that WordPerfect Corporation has changed their policy on educational discounts. It took me nine months to save so I could afford their word processor at the discount price, only to find that they now offer the discount only to IBM and Mac users—not Amiga!

I am confused. An educational discount is a smart move for companies to make. It allows students to afford basic hardware and software for use during school years, and after they graduate and start working, they remember who helped them and purchase upgrades and new packages for home and work use. I would like to suggest that Amiga users write and complain to WordPerfect about the discount policy. Is this the company's first step in abandoning the Amiga market?

Robert Singleterry, Jr.
Tucson, Arizona

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2. Hypothetically, if *AmigaWorld* could provide coverage of only 6 of these subjects every month, which 6 would you choose?

g. ☐ Business/accounting
h. ☐ Database management
i. ☐ Desktop publishing
j. ☐ Education
k. ☐ Games/entertainment
l. ☐ 2-D graphics/animation
m. ☐ 3-D graphics/animation
n. ☐ Home productivity and finance
o. ☐ IBM/Mac emulation/conversion
p. ☐ Multimedia production/presentation
q. ☐ Music/sound
r. ☐ Operating system software
s. ☐ Programming
t. ☐ Science/engineering (CAD, Unix, etc.)
u. ☐ System upgrade/expansion (hardware)
v. ☐ Telecommunications
w. ☐ Video
x. ☐ Word processing

3. Which 4 regular monthly sections (not articles) of *AmigaWorld* do you find most valuable?

y. ☐ Accent on Graphics
z. ☐ Back Talk
1. ☐ Chief Concerns
2. ☐ Crib Notes
3. ☐ Game Reviews
4. ☐ Help Key
5. ☐ The Last Word
6. ☐ Overscan
7. ☐ Reviews (General)
8. ☐ Video Suite

4. Which 4 regular monthly sections (not articles) of *AmigaWorld* do you find least valuable?

9. ☐ Accent on Graphics
a. ☐ Back Talk
b. ☐ Chief Concerns
c. ☐ Crib Notes
d. ☐ Game Reviews
e. ☐ Help Key
f. ☐ The Last Word
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18	43	68	93	118	143	168	193
19	44	69	94	119	144	169	194
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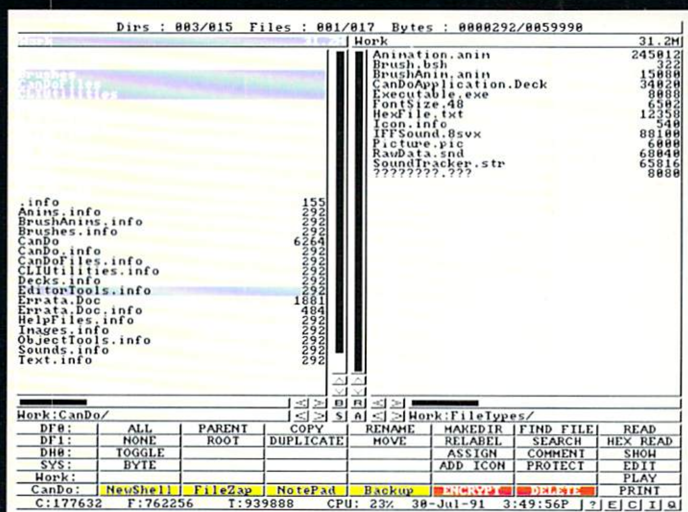
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